AN EXPLICATION OF THE REACTANCE PROCESSING MODEL

A Dissertation

by

BRIAN LEE QUICK

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2005

Major Subject: Speech Communication

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Approved by:

Chair of Committee,	Michael T. Stephenson
Committee Members,	Alicia M. Dorsey
	Katherine I. Miller
	Richard L. Street, Jr.
Head of Department,	Richard L. Street, Jr.

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ABSTRACT

An Explication of the Reactance Processing Model. (August 2005)

Brian Lee Quick, B.S., College of the Ozarks;

M.A., Southwest Missouri State University

Chair of Advisory Committee: Dr. Michael T. Stephenson

The present dissertation applied the theoretical assumptions of Psychological Reactance Theory into a model depicting how individuals cognitively process reactance-inducing print messages utilizing a communication framework, the Reactance Processing Model (RPM). Specifically, the RPM conceptualizes reactance as a motivational state, investigates the degree of reactance arousal elicited by threat-to-choice, vivid, and explicit language (along with an additive effect of the aforementioned message features), empirically measures reactance restoration, and explores the role of issue involvement on message processing of reactance-inducing print messages advocating exercise and sunscreen usage by college students ($N = 550$). The RPM was tested using an experimental 2 (implicit vs. explicit) X 2 (non-vivid vs. vivid) X 2 (low-threat-to-choice language vs. high-threat-to-choice language) posttest only design.

Four general conclusions are drawn from this investigation. First, results support operationalizing reactance as a latent construct comprised of unfavorable cognitions and state anger. Second, of the three message features examined, high threat-to-choice and vivid language, along with a combination of both were found to elicit reactance. Explicit language did not trigger reactance in this study. Third, perceived high threat-to-choice language was positively associated with reactance whereas perceived vivid and

explicit language was either negatively or not associated with reactance. Fourth, reactance was positively related to three types of restoration including "Boomerang," "Related Boomerang," and "Vicarious Boomerang." Specifically, "Boomerang" restoration appears to be triggered regardless of threat attractiveness whereas "Related Boomerang" and "Vicarious Boomerang" require an attractive threat before being set into motion. Results from this investigation along with the limitations and heuristic value of the RPM are provided.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Among campaigners it is generally accepted that theoretically driven campaigns significantly increase the probability of an effective campaign (Maibach & Parrott, 1995). Although this belief is held among most academics, some health campaigners and advertising practitioners feel that theory-based messages are ineffective at changing attitudes, cognitions, or behaviors (see Dejong & Wallack, 1999; McCaffrey, 2000; DeJong & Wallack, 2000). Regardless of the presence of theory-based messages, a campaign's success or failure is impacted by other factors such as (a) adequate formative research, (b) sufficient resources, (c) professional messages, (d) ample exposure, and (e) proper evaluation (Rogers & Storey, 1987). Nevertheless, the importance of grounding a campaign in theory is evident by the sheer number of successful theory-based campaigns (see Hornik, 2002; Rice & Atkin, 2001). Also, support for theory-based campaigns is manifest in the number of books advocating this reasoning (Crano & Burgoon, 2002; Hornik, 2002; Maibach & Parrott, 1995; Rice & Atkin, 2001; Salmon, 1989; Thompson, Dorsey, Miller, & Parrott, 2003). In essence, Maibach and Parrott (1995) argue that by utilizing good theory, campaigners "will help enable our citizens to live healthier and more productive lives: and it will ultimately, through its impact on subsequent research and evaluation efforts, advance our understanding of the mechanisms and dynamics of effective public health communication" (p. xii).

This dissertation follows the style of *Health Communication*.

Using theory-based messages is imperative for communication scientists for five reasons. First, theories inform campaigners by describing cognitive processes (Petty & Cacioppo, 1986; Chaiken, 1980), predicting outcomes (Fishbein & Ajzen, 1975; Festinger, 1957), explaining relationships between variables, and prescribing recommendations for future interventions (Maibach & Parrott, 1995). That is, researchers employing theory-based messages are more equipped to articulate a rational explanation for why specific messages are effective or ineffective. Second, theories are useful in informing scientists about the most useful components for designing messages (DiClemente & Prochaska, 1985; Fishbein & Ajzen, 1975; Witte, 1992). Third, researchers are better able to verify and falsify the tenets and assumptions of theories (Baker, Petty, & Gleicher, 1991). Fourth, theories provide road maps for campaigners. Last and perhaps most important, theory-based messages significantly enhance the likelihood of a campaign's effectiveness (Hornik, 2002; Maibach & Parrott, 1995; Rice & Atkin, 2001; Salmon, 1989).

Social scientific theory is visibly present as the foundation of several health campaigns. In fact, numerous campaigns utilize components of Rosenstock's (1974) Health Belief Model, Fishbein and Ajzen's (1975) Theory of Reasoned Action, Bandura's (1977) Social Cognitive Theory, DiClemente and Prochaska's (1985) Stages of Change Model and Witte's (1992) Extended Parallel Process Model as a framework for message construction.

The present investigation entertains the idea that campaigners are underutilizing particular theories while aiming to dissuade adolescents from engaging in risky

behaviors. Particularly, theories that take into consideration freedom and choice appear fruitful provided the importance of autonomy among adolescents (Caissy, 1994; Hong, Giannakopoulous, Laing, & Williams, 1994). Although several of the aforementioned theories advance our understanding of how audiences are influenced attitudinally, affectively, cognitively, and behaviorally, only Jack Brehm's (1966) Psychological Reactance Theory (PRT) takes one's need for autonomy into consideration. When your target audience is adolescents and young adults, taking autonomy into consideration is imperative given their need for independence (Brehm & Brehm, 1981).

The application of PRT research can be found in both laboratory and applied contexts (see Burgoon et al., 2002). However, despite the wealth of PRT research, the theory's presence within the health campaign literature is nonexistent until recently. In light of the theory's scarcity, following Burgoon, Alvaro, Grandpre et al.'s (2002) spirited review of PRT, several recent research reports applied the theory to health campaigns (Burgoon, Alvaro, Broneck et al., 2002; Dillard & Shen, 2004; Grandpre, Alvaro, Burgoon, Miller, & Hall, 2003; Stephenson & Quick, 2004). Specifically, researchers tackled the question of how to conceptualize reactance (Dillard & Shen, 2004) as well as factors mediating the amount of reactance following exposure to high- and low-threat-to-choice messages (Stephenson & Quick, 2004). Although the application of PRT exists across a variety of contexts, the theory appears to be underdeveloped with regards to its application within health campaigns.

The underutilization of PRT within health campaigns aimed at adolescents is unfortunate given the theory's assumptions. PRT places a premium on individual choice

(Brehm, 1966; Brehm & Brehm, 1981). Specifically, PRT predicts that individuals confronted with a message that threatens to remove their freedom will experience reactance, and thus, are motivated to restore their threatened or lost freedom (Brehm, 1966; Brehm & Brehm, 1981). Burgoon, Alvaro, Grandpre et al. (2002) argue that there is "probably no other extant theoretical position that is more intuitively sensible than that outlined in the theory of psychological reactance" (p. 215). Their argument is especially noteworthy given the salience adolescents place on autonomy (Caissy, 1994; Hong, Giannakopoulous, Laing, & Williams, 1994). Furthermore, in support of PRT's validity, Burgoon, Alvaro, Grandpre et al. (2002) suggest that it is not "evident on what criteria (if any), of theoretical utility and scientific validity of which we are aware, are not met by the reactance formulation" (p. 226).

The present dissertation sets out to advance PRT in three central dimensions. First, the majority of the PRT literature treats a message as a single identity rather than dividing a message into unique message features. In fact, several communication researchers have called for more scholarly attention to be given toward identifying which message features elicit reactance (Burgoon, Alvaro, Grandpre et al., 2002; Dillard & Shen, 2004; O'Keefe, 2003; Stephenson & Quick, 2004). In response to this charge, three specific message features are examined in this manuscript: threat-to-choice language, vivid description of consequences, and explicit recommendations. In addition to testing main effects for each message feature, analyses also test whether or not a message including explicit, vivid, and high-threat-to-choice language elicits greater reactance than a message containing implicit, vivid, and high-threat-to-choice language.

Second, a model of how individuals process low- and high-threat-to-choice messages, the Reactance Processing Model (RPM), is presented in this dissertation. The RPM is grounded in PRT, the Elaboration Likelihood Model (ELM), and the Heuristic-Systematic Model (HSM). Brehm and Brehm (1981) state, "The role of cognitive processes in association with reactance in attitude change phenomena is potentially important and complex" (p. 396). Furthermore, the theorists state that given the cognitive complexities following exposure to a threatening message, one can speculate that differential processing is likely following reactance arousal (Brehm & Brehm, 1981). Recently, communication scientists began exploring the mental processes at work following exposure to low- and high-threat-to-choice health ads (Stephenson & Quick, 2004). Although these research investigations shed new light into the cognitive processes at work following threatening messages, the RPM provides a parsimonious model to explain the cognitive mechanisms at work following low- and high-threat-to-choice messages.

Third, the Reactance Restoration Scale (RRS) is presented as a measure to assess the outcomes associated with reactance. This scale advances this research beyond existing single-item measures and offers some measurement consistency of reactance outcomes that currently does not exist. Presently, many scientists rely on single-item attitudinal and behavioral intention items to measure the outcomes associated with psychological reactance (Dillard & Shen, 2004; Stephenson & Quick, 2004). Three problems persist with the current measures employed. First, as scientists interested in studying this phenomenon, without reliable and valid instrumentation to measure the

impact of reactance, the replication of outcomes is significantly hindered. Second, by relying on single-item rather than multi-item latent variables, communication scientists are unable to remove measurement error when modeling the cognitive processes at work following low- and high-threat-to-choice messages (Holbert & Stephenson, 2002; 2003; Stephenson & Holbert, 2003). In short, relying on observed or manifest, as opposed to latent, variables hinders the precision and threatens the validity of scientific claims. Third, present PRT research only measures direct restoration, as articulated by PRT (Brehm, 1966). Although direct restoration is one outcome associated with reactance, indirect restoration is a plausible, yet unexplored concept (Brehm & Brehm, 1981). Therefore, the present manuscript builds off of previous PRT research (Burgoon, Alvaro, Broneck et al., 2002; Dillard & Shen, 2004; Grandpre et al., 2003; Stephenson & Quick, 2004) as well as the theory's originators (Brehm, 1966; Brehm & Brehm, 1981) by providing a reliable and valid instrument to consistently assess both direct and indirect restoration.

The present investigation is split into two sections. The first section of Chapter II provides an overview of PRT whereas the second section explicates the RPM. Specifically, in the first section I (a) identify the properties of PRT, (b) conceptualize reactance both as a trait and state, (c) provide a detailed account of the outcomes associated with reactance within a health context, and (d) articulate the four theoretical principles of PRT using published accounts from the health literature. In the second section, I (a) review the conceptualization of reactance as a motivational state, (b) articulate three message features that are likely to enhance reactance including threat-to-

choice, vivid, and explicit language, (c) examine the outcomes associated with reactance-inducing messages, and (d) identify the role of involvement on processing reactance-inducing messages. I begin by providing an overview of PRT.

Psychological Reactance Theory Overview

Psychological Reactance Theory (PRT) explains how individuals respond when their freedom is threatened or eliminated (Brehm, 1966). The major assumption behind PRT is that individuals cherish their freedom to choose among alternatives (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981). Put another way, Grandpre et al. (2003) state that individuals maintain a need for freedom or autonomy, while viewing themselves as "responsible for their own fate" (p. 351). According to PRT, as individuals, each of us believes that we have specific freedoms, not general freedoms. If these freedoms are threatened (either by a persuasive message or by another individual), then individuals are motivated to reassert or regain that threatened freedom (Brehm & Brehm, 1981).

This need for freedom arises during early adolescence, the age when most begin to experiment with the risky behaviors that health campaigners warn against such as engaging in unprotected sex or using illicit drugs (Burgoon, Alvaro, Broneck et al., 2002). Adolescents seem to be a prime subgroup for reactance arousal given their propensity to engage in risky behaviors coupled with their strong desire for autonomy (Caissy, 1994; Hong, Giannakopoulous, Laing, & Williams, 1994).

PRT specifies four theoretical principles that provide testable hypotheses for researchers. However, before reviewing the research in support of each principle,

attention is given to the underlying constructs of PRT. To begin, freedom and control are discussed along with how both influence the magnitude of reactance arousal. Next, attention is given to what constitutes a threat. As predicted by PRT, as the magnitude of the threat increases, the amount of reactance also increases. After defining what constitutes a threat, it is only natural to articulate how reactance is defined. Specifically, reactance is discussed as both a trait and psychological state. PRT predicts that reactance prompts individuals to restore their threatened or lost freedoms. Thus, how individuals restore their threatened or lost freedoms directly or indirectly is presented. This section concludes with a discussion of the four principles of PRT.

Freedom

Freedoms are subjective realities that are developed cognitively over time (Brehm & Brehm (1981). It is not surprising then, that considerable variation exists between individual beliefs regarding specific freedoms. Individuals' subjective freedoms are derived from "life experiences, cultural patterns, as well as through behaviors modeled within their social and physical environments" (Brehm & Brehm, 1981, p. 22). Therefore, psychological reactance is experienced at various levels of intensity ranging from complete doubt to complete conviction (Brehm, 1966; Burgoon, Alvaro, Grandpre, & Voulodakis, 2002). PRT states that a freedom can only be threatened or eliminated once it is established. Freedoms that do not exist cannot be threatened or eliminated.

Freedoms can be either absolute or conditional (Brehm, 1966; Wicklund, 1974). Absolute freedoms are available during the present and future in every situation. For

example, an individual's freedom to smoke cigarettes inside his or her home is an absolute freedom. To the contrary, conditional freedoms are context dependent. For instance, an individual's freedom to smoke is restricted in certain environments, such as inside a restaurant and office.

Control

In PRT, control and freedom are equivalent terms. If an individual has control of a behavior, he or she is assumed to possess the necessary skills and ability to perform a particular behavior. Control is referred to as "the ability to affect a specific outcome" (Brehm & Brehm, 1981, p. 383). Control motivation is an internal state aimed at regaining control over an outcome. According to Brehm (1993), individuals maintain two types of control motivations, reactive and effectance. PRT is primarily concerned with the former.

A reactive control motivation occurs when an individual is motivated to reestablish a lost freedom (Brehm, 1993). For example, one who takes great pleasure in consuming alcoholic beverages will experience a reactive control motivation following the removal of the freedom to consume his or her favorite drink. Conversely, effectance refers to a proactive exploration toward obtaining as many freedoms as possible (Brehm, 1993). For instance, an individual motivated to push the limits put forth by his or her parents are acting in accordance with an effectance control motivation. Both control motivations, reactive and effectance, influence the magnitude of reactance arousal.

According to PRT, once a certain behavior is perceived to be within one's control, it is considered a free behavior. Brehm (1966) defines a free behavior as "acts

that are realistically possible" (p. 3). Before a behavior is said to be free, an individual must possess the physical, social, financial, and psychological resources to exercise the particular freedom, as well as knowing that he or she may successfully perform the behavior. Competency, also referred to as self-efficacy in many texts, refers to a belief in one's ability to perform a specific behavior (Bandura, 1977). Hence, before someone can choose whether or not to wear sunscreen, he or she must know how to correctly apply the product to his or her body. Brehm and Brehm (1981) suggest that competency is established via frequent and successful opportunities to decide among alternatives. PRT suggests that as perceptions of control increases, the magnitude of reactance arousal also increases following a threat (Brehm, 1966). In sum, PRT suggests that individuals must possess knowledge and ability before maintaining control over a behavioral freedom (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981; Burgoon, Alvaro, Grandpre et al., 2002). Thus, with freedom and control to perform a particular behavior, individuals will likely experience reactance following a threat.

Threat

In PRT, "any force on the individual that makes it more difficult for him or her to exercise the freedom constitutes a threat to it" (Brehm & Brehm, 1981, p. 30). Threats fall along a continuum ranging from mild to severe. In fact, Brehm (1966) argues that any persuasive attempt, to some extent, is a threat. However, not all persuasive messages threaten one's freedom to the same magnitude. Despite that, PRT maintains that any threat to or loss of a freedom will motivate individuals to restore that freedom by "maintaining their initial opinions or, more provocatively, by changing their opinions

in a direction opposite to the position advocated" by the message (Eagly & Chaiken, 1993, p. 569). The motivational force behind the desire to restore a threatened or eliminated freedom is referred to as reactance.

Reactance

State Reactance

Reactance is an aversive motivational state that is assumed to energize particular behaviors (Brehm, 1966). According to PRT, the magnitude of reactance aroused is largely dependent on the perceived attractiveness, or importance, of the threatened or eliminated freedom. As the threat attractiveness increases, the level of reactance also increases (Brehm, 1966; Brehm & Brehm, 1981). For example, if Dan loses his freedom to have alternative B, the amount of reactance arousal experienced is a direct function of how attractive he perceives alternative B.

Prior to Dillard and Shen's (2004) work, researchers did not directly measure state reactance. Instead, researchers employed manipulation checks (i.e., "The message tried to manipulate me," "The message tried to make a decision for me," "The message tried to control me," and "The message threatened my freedom to choose") to assure messages were interpreted appropriately along with assessing the outcomes of high-threat-to-choice messages (Burgoon, Alvaro, Broneck et al., 2002; Grandpre et al., 2003). Until recently, the reliance on manipulation checks and outcome measures to assess reactance arousal predominated the PRT literature. However, developments by Dillard and Shen (2004) provided researchers with a useful framework for measuring reactance.

Grounded by the work of social scientists Chaffee and Berger (1987) who advocate the operationalization of a concept for theory advancement, Dillard and Shen (2004) argue that reactance triggers both an emotional (anger) and a cognitive response (unfavorable thoughts) in reaction to a threatened freedom. They argue that, together, both components provide an accurate assessment of state reactance.

Dillard and Shen (2004) examined four options of measuring reactance via structural equation modeling including (a) reactance viewed as purely cognitive, (b) reactance viewed as purely emotional, (c) reactance viewed as both affect and cognition, and (d) reactance depicted as a latent variable comprised of both affect and cognition. Their data demonstrated that state reactance consists of cognitive and affective responses. Furthermore, they argue that cognitive and affective responses are "empirically inseparable" when measuring state reactance (p. 24). Despite arguments from Brehm (1966) that reactance cannot be measured, Dillard and Shen (2004) argue that reactance is best captured with both emotional and cognitive properties. However, when assessing state reactance following high-threat-to-choice messages, research does not consistently demonstrate that anger and unfavorable cognitions load as a latent variable (Stephenson & Quick, 2004).

Brehm and Brehm (1981) conceive of reactance as "a motivational state" (p. 35). The limited amount of research that conceptualizes reactance as a state is problematic. Instead of measuring reactance as a state, the majority of PRT research treats reactance as a trait. Therefore, before examining the outcomes associated with state reactance, attention is given to trait reactance.

Trait Reactance

Measuring reactance as a trait is a valuable contribution to the social sciences, particularly for health campaigners. After more than a decade of measuring trait reactance, social scientists are better able to identify individuals that are prone to experience reactance. As a result of this research line, Burgoon, Alvaro, Grandpre et al. (2002) hypothesize that reactance arousal is greater among individuals that (a) are autonomous and value their independence, (b) feel their behaviors are being attacked or challenged, and (c) believe they are competent and knowledgeable enough to make their own decisions on the matter.

Trait reactance scales emerged beginning in the late 1980s (Hong & Faedda, 1996; Hong & Page, 1989; Hong, 1992; Merz, 1983). Hong and Page (1989) were the first to propose measuring reactance as an enduring personality trait. The Hong Psychological Reactance Scale (HPRS) found that reactance consists of four dimensions including: (a) freedom of choice, (b) conformity reactance, (c) behavioral freedom, and (d) reactance to advice and recommendations. In total, the four factors accounted for 52.7% of the total variance.

A few years later, Hong (1992) tested the reliability of Hong and Page's (1989) 14-item HPRS using a non-student adult population in Australia. For this study, Hong (1992) selected 462 participants ranging from 19 to 40 years old to complete the scale. Their study merely replicated Hong and Page's (1989) earlier work. In total, the four factors accounted for 55.4% of the total variance. More specifically, freedom of choice explained 26.7% of the variance; conformity reactance explained 13% of the variance;

behavioral freedom explained 8% of the variance; and reactance to advice and recommendations explained 7.7% of the variance.

More recently, Hong and Faedda (1996) refined the HPRS from a 14-item to an 11-item scale. When comparing the 11-item scale to the 14-item scale, an exploratory factor analysis conducted by Hong and Faedda (1996) discovered that the 11-item scale accounted for 61.2% of the variance compared to only 54.1% with the 14-item scale. For the 11-item scale, the same four factors applied: (a) emotional response toward restricted choice, (b) reactance to compliance, (c) resisting influence from others, and (d) reactance toward advice and recommendations. The overall alpha reliabilities for the 11-item ($\alpha = .75$) and 14-item ($\alpha = .79$) scales mirror one another. Despite their confirmation of the HPRS, the scale recently came under attack due to the unreliability of the four subscales (Donnell, Thomas, & Buboltz, 2001).

In addition to the HPRS, Donnell, Thomas, and Buboltz (2001) analyzed Merz's (1983) Questionnaire for the Measurement of Psychological Reactance (QMPR). In doing so, the researchers distributed the QMPR to 898 college students in the United States. Following their re-evaluation of the QMPR, Donnell et al. (2001) found that the QMPR accounted for 38.3% of the total variance. Additionally, these researchers suggested that there are three factors: (a) response to advice and recommendations ($\alpha = .69$), (b) restriction of freedom ($\alpha = .56$), and (c) preference for confrontation ($\alpha = .48$). The overall alpha reliability of the QMPR was .76 (Donnell et al., 2001).

Researchers have also discovered correlates of trait reactance. Specifically, the work of Dowd and colleagues illustrates a positive association between autonomy,

denial, dominance, independence, interpersonal mistrust, self-sufficiency, lack of conformity, and a lack of tolerance with trait reactance (Dowd & Wallbrown, 1993; Dowd, Wallbrown, Sanders, & Yesenosky, 1994; Seibel & Dowd, 2001).

To summarize, Dillard and Shen's (2004) theoretical advancement of reactance extends Brehm's (1966) theory in an important way by providing an operational definition of state reactance. Following a detailed overview of how reactance is conceptualized and operationalized, both as a state and personality trait, the next section summarizes the outcomes commonly associated with reactance.

Outcomes of Reactance

PRT predicts that when a choice is threatened or eliminated, people are motivated to restore their threatened or lost freedom by "maintaining their initial opinions or, more provocatively, by changing their opinions in a direction opposite to the position advocated" by the message (Eagly & Chaiken, 1993, p. 569). Individuals act upon this motivation by restoring their threatened or eliminated freedom directly or indirectly (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981).

Direct Restoration

Direct restoration is exercised in two ways. First, direct restoration occurs whenever people exercise a threatened freedom by expressing their independence behaviorally, cognitively, or emotionally in a manner opposite the threat. Within the RRS, this type of direct restoration is called "Boomerang." For example, suppose Jill is told not to smoke marijuana in a threatening manner that elicits reactance. She will restore her threatened freedom by (a) smoking marijuana, (b) thinking favorably about

marijuana, or (c) developing a positive emotional response towards marijuana (Donnell et al., 2001). Threatened or eliminated freedoms restored in this manner are referred to as boomerang effects. Boomerang effects are common within PRT studies (e.g., Brehm & Mann, 1975; Heller, Pallak, & Picek, 1973) surrounding different topics including alcohol consumption (Dillard & Shen, 2004), behaviors such as gripping a dynamometer (Aletky & Carlin, 1975), marijuana use (Burgoon, Alvaro, Broneck et al., 2002), movie preference (Worchel, 1972), and sunglasses (Wicklund, Slattum, & Solomon, 1970), tobacco (Grandpre et al., 2003), and toy preferences (Brehm & Weinraub, 1977).

Second, direct restoration occurs whenever an individual does not exercise the specific threatened or eliminated freedom but instead performs a related liberty. This type of direct restoration is common whenever restoring a specific freedom perceived to be costly (Brehm, 1966). Within the RRS, this type of direct restoration is called "Related Boomerang." For example, suppose Mike is exposed to a high-threat-to-choice message that communicates the harmful effects of smoking marijuana. Following exposure to this message, Mike experiences reactance and is motivated to prove his autonomy to make decisions regarding risky substances. However, he does not have access to marijuana. Given his obstacle of smoking marijuana, Mike decides to exercise his freedom to partake in risky behaviors by drinking alcohol irresponsibly instead. Unlike the former instance of direct restoration, the latter has received little empirical attention (Brehm & Brehm, 1981).

Indirect Restoration

A threatened freedom can be restored indirectly by vicariously observing others

engage in the forbidden behavior (Brehm, 1966). Brehm and Brehm (1981) suggest that a motivationally-aroused individual, who feels unable to restore a threatened freedom directly, might seek out others who will behave in a freedom-restoring manner. This last type of restoration is referred to as "Vicarious Boomerang" within the RRS. For instance, following exposure to a freedom-threatening message pertaining to marijuana usage, Kathy may restore her threatened freedom by defiantly observing Rick smoke marijuana. In light of this explanation, "Vicarious Boomerang" could explain why people, particularly adolescents, often associate with "bad boys" or "bad girls." Also, along similar lines, "Vicarious Boomerang" could explain why individuals attend to deviant television programming as a means of living vicariously through rebellious characters.

Understanding (a) how individual freedoms and control affect the subjective interpretation of a threat; (b) how a perceived threat will impact the magnitude of reactance; and (c) how reactance is restored both directly and indirectly following a threat was imperative before discussing the four principles of PRT. In the following section, the four theoretical principles of PRT are discussed.

PRT Theoretical Principles

Brehm (1966) identifies four theoretical principles underlying PRT. Principles 1 and 3 provide a rationale for deriving testable hypotheses within the context of persuasive messages. Collectively, the two principles represent the core of PRT. In contrast, Principles 2 and 4 provide a rationale for exploring the antecedents to reactance, or more fundamentally, what elements contribute to one's perceptions that a

freedom has been threatened.

Principles 1 and 3

The first principle states that reactance can only be aroused if individuals believe they have freedom over a specific outcome (Brehm, 1966). Further, Brehm and Brehm (1981) state that individuals must possess the knowledge that a freedom exists, and, feel competent in their ability to perform the behavior. To illustrate, consider the 1987 law prohibiting U.S. citizens under the age of 21 from consuming alcoholic beverages. This federal law essentially restricts the freedom of some individuals to drink alcoholic beverages. For some college students, this is problematic since they are prohibited, legally, from participating fully in certain social activities and celebrations. Following PRT principle 1, if underage college students believe they have the freedom to consume alcohol, and, if they feel competent in their ability to do so responsibly, then reactance will be aroused.

Consistent with PRT, two published studies provide evidence for PRT regarding the law prohibiting underage U.S. citizens from consuming alcohol (Allen, Sprenkel, & Vitale, 1994; Engs & Hanson, 1989). First, Engs and Hanson (1989) found that underage college students drank significantly more alcohol compared to college students who are a legal drinking age. Their study of 3,375 students from 56 colleges in the United States demonstrated that underage students (81.2%) were significantly more likely to drink alcohol than those of legal drinking age (75.3%). Moreover, underage drinkers (24.09%) were more likely to be heavy drinkers compared to their legal counterparts (15.39%). Allen, Sprenkel, and Vitale (1994) corroborated this evidence by

discovering that 2,142 students under the legal drinking age from 10 different universities in Minnesota, Iowa, and South Dakota reported significantly more alcohol consumption per month, more drinks the last time out, and more drinks in one sitting than their legal counterparts. Furthermore, Allen et al. (1994) found that male participants, regardless of age, reported drinking more alcohol than their female counterparts. Taken together, these findings offer concrete illustrations of principle 1, which states that negative outcomes occur when individual freedoms are removed.

The third principle of PRT (Brehm, 1966), which is a corollary to the first, states that reactance increases as the number of threats increases. This principle has received empirical support. For example, individuals told to "please throw this away" littered more than individuals who received literature telling them to do nothing about littering (Jorgenson, 1978, cited in Brehm & Brehm, 1981). Similarly, stronger demands such as "don't litter" and "don't you dare litter" produced more littering than polite or irrelevant messages on pool safety (Reich & Robertson, 1979). More recently, Dillard and Shen (2004) tested this principle by assessing the effectiveness between both binge-drinking and flossing ads featuring high- and low-threat messages. Undergraduate participants exposed to the high-threat-to-choice message in both contexts reported significantly more unfavorable thoughts and anger than participants exposed to the low-threat-to-choice messages. The practical implication is to avoid high-threat-to-choice messages altogether in favor of informative messages when designing health messages.

These two principles intimate that, when viewers are exposed to a message that argues strongly for a particular behavior such as drinking responsibly, the ad may indeed

elicit psychological reactance. One can conclude from the aforementioned studies that a high-threat-to-choice ad will elicit more reactance than a low-threat-to-choice ad.

Principle 2

Principle two pertains to the relationship between attitudinal importance and the magnitude of reactance. Brehm and Brehm (1981) assert that as the threatened behavior increases in attractiveness, so does the amount of reactance elicited. This principle is illustrated in a 2-study experiment examining the drinking intentions of college students who were exposed to either a low- or high-threat-to-choice message about drinking (Bensley & Wu, 1991). To test the effects of threatening messages on alcohol consumption, 535 college students were recruited to participate in the study. Participants were classified as abstainers ("never drink"), occasional drinkers ("drink at least once a year but less than once a month"), light/moderate drinkers ("drink at least once a month but no more than 3-4 drinks each time"), and heavy drinkers ("drink nearly every day or weekly, often 5 or more drinks each time"). Following the presentation of a persuasive message, participants indicated that the high-threat-to-choice message led to significantly more negative message ratings for male and female heavy drinkers as well as for female occasional drinkers. Interestingly, the female abstainers significantly preferred the abstinence recommendations whereas male occasional drinkers preferred the controlled drinking recommendation, across all levels of threat. Similarly, high-threat-to-choice messages resulted in significantly more drinking intentions compared to low-threat-to-choice messages.

The results of a second study by Bensley and Wu (1991) are equally interesting.

Bensley and Wu (1991) recruited 74 college students to participate. Of those selected for participation, the researchers retained only light/moderate and heavy drinkers. Following exposure to a high- and a low-threat-to-choice message, participants were given the opportunity to consume beer. Not surprisingly according to PRT, participants receiving the high-threat-to-choice communication consumed a third more beer than participants in the low-threat-to-choice condition. More specifically, male heavy drinkers exposed to the high-threat-to-choice message drank significantly more participants exposed to the low-threat-to-choice message. In fact, male heavy drinkers drank significantly more than any other condition (Bensley & Wu, 1991). Similarly, results showed that male heavy drinkers exposed to the high-threat message reported more drinking intentions compared to the other three conditions. Taken together, the results from both investigations provide strong empirical support for low-threat-to-choice messages when the topic under discussion is important to the audience.

Principle 4

The final principle, principle four, asserts that additional implied threats will increase the magnitude of reactance (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981). An implied threat is one that is not clearly stated by the source. Although an implied threat may be indirect or obscure, the possibility exists that the receiver may perceive it.

While masking persuasive intent appears ill-advised, other literature suggests that forewarning receivers about persuasive intent is equally imprudent. Meta-analytic studies show that the disclosure of persuasive intent, or forewarning, elicits a "modest

reduction" in the persuasiveness of the message (Benoit, 1998, p. 145). Suggesting to receivers that a message is intentionally persuasive motivates individuals to scrutinize the message more carefully and actively refute the message (Petty & Cacioppo, 1979).

The aforementioned implies a fine line for creators of health messages advocating a specific health-behavior such as alcohol consumption. Forewarning viewers about an ad's intent to persuade viewers about drinking responsibly seems silly, but crafting a message that is inexplicably persuasive can be difficult. Instead of "announcing" their persuasive intent, health ads often employ crafty audiovisual techniques, including structural and content features, to make the ad more appealing to the intended audience (e.g., Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001). If producers can generate a favorable attitude toward the ad, then viewers will often maintain a favorable attitude toward the topic, even for health-related ads (Dillard & Peck, 2001). The question is, to what extent do viewers perceive a television ad's structural and content features as an attempt at persuasive manipulation? Structural features of health-related television messages (e.g., cuts, pacing, sound effects) have a history of enhancing persuasiveness with certain audience segments (Palmgreen et al., 2001; Stephenson, 2003). Some content features, such as employing a narrative structure in order to offset counterarguing, also may be persuasive (Slater, 2002). Nevertheless, despite limited research to back principle four, PRT suggests, as implied threats appear, the magnitude of reactance increases.

To summarize, reactance is particularly likely when individuals feel (a) knowledgeable and competent to make the decision, (b) the threatened freedom is of

high importance and is physically or socially attractive, and (c) the number of threats is increased or implied threats are communicated (Burgoon, Alvaro, Grandpre, 2002; Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981; Janis & Mann, 1977; Wicklund, 1974).

The Reactance Processing Model

Despite the evidence in support of PRT, the underlying processes to explain these findings remain unexplored. Therefore, the following section introduces the Reactance Processing Model (RPM). The RPM is a model that (a) conceptualizes reactance as a motivational state comprised of state anger and unfavorable cognitions, (b) proposes specific message features that elicit state reactance, (c), examines the association between direct and indirect restoration with state reactance, and (d) explores the role of issue involvement on the message processing of a reactance-inducing message. Until recently, research has not explored the manner in which high-threat-to-choice messages are cognitively processed (Stephenson & Quick, 2004; Rains & Mitchell-Turner, 2004). These research lines suggest that individuals process low- and high-threat-to-choice messages differently. For instance, Stephenson and Quick (2004) found that the cognition-attitude relationship was significantly stronger for the low- than the high-threat-to-choice ad. Meanwhile, Rains and Mitchell-Turner (2004) found that reactance-eliciting messages prompted feelings of anger, which led to biased processing and subsequent negative message evaluations. This finding resonates with Nabi's (2002) work, which suggests that anger arousal initiates biased processing. In short, the

research addressing how high-threat-to-choice messages are processed is underdeveloped.

As communication scholars studying health campaigns, we are concerned with what message features elicit reactance (Dillard & Shen, 2004). However, before we discuss specific message features that elicit reactance, attention to the operationalization of state reactance is provided.

Reactance

Reactance is a motivational state that prompts individuals to restore a threatened or eliminated freedom (Brehm, 1966). For years, researchers argued that reactance could not be empirically measured and as a result, the literature on PRT was significantly hindered. However, recently, communication researchers conceptualized reactance as a combination of anger and unfavorable cognitions (Dillard & Shen, 2004; Stephenson & Quick, 2004). Although these researchers are not in complete agreement regarding the manner in which both constructs constitute reactance, both agree that reactance can be operationalized via anger and thought-listing assessments (Dillard & Shen, 2004; Stephenson & Quick, 2004). In the section below, attention is given to the two components that comprise reactance.

Anger

Anger is generally elicited following exposure to (a) an obstacle that interferes with one's goals, (b) demeaning offenses against oneself, or (c) inappropriate acts towards one's friends and family (Izard, 1977; Lazarus, 1991; Nabi, 1999; 2002). Like other emotions, anger is often short-lived, intense, and directed at an external source in

response to a thwarted goal (Dillard & Meijnders, 2002; Nabi, 2002). Arguably, an individual presented with a reactance-inducing message is likely to feel frustrated, due to beliefs favoring individual choice, particularly within individualistic-oriented cultures like the United States (Brehm, 1966; Samovar & Porter, 2004).

Anger impacts how individuals process messages. For example, research suggests that angry individuals process messages more when angry (Nabi, 1999). Consequently, increased message scrutiny following exposure to a reactance-inducing message should enhance the magnitude of reactance, thus drawing more attention to the threat, and consequently eliciting greater reactance (Nabi, 1999). In fact, the positive association between reactance and anger has been demonstrated within the PRT literature (Dillard & Shen, 2004; Stephenson & Quick, 2004). Thus, it appears justified to expect increased anger as a result of reactance arousal.

Unfavorable Cognitions

One conventional method for assessing message processing is via the thought-listing technique (Petty & Cacioopo, 1986). Brock (1967) and Greenwald (1968) originated this technique as a method to track the quality and quantity of cognitive activity involved in persuasion. Recent PRT research suggests that exposure to reactance-inducing messages yields significantly more unfavorable cognitions than exposure to a low-threat-to-choice message (Dillard & Shen, 2004; Stephenson & Quick, 2004). Thus, just as it is appropriate to measure anger following reactance-inducing messages, unfavorable cognitions should also be assessed. Therefore, a reactance-

inducing message is likely to increase the number of unfavorable cognitions experienced by individuals.

Reactance Structure

Although recent research states that reactance features elements of both anger and unfavorable cognitions, how these two components constitute reactance has produced inconsistent results. For instance, Dillard and Shen's (2004) results indicate that reactance is best operationalized as a latent variable comprised of an inseparable construct consisting of anger and negative cognitions. However, Stephenson and Quick (2004) were unable to replicate this finding. For them, state anger and unfavorable cognitions did not load as a latent variable, but rather were depicted as separate entities. Conversely, Stephenson and Quick's (2004) explanation for how reactance is conceptualized aligns more closely with Leventhal's (1970) parallel processing model. Leventhal's (1970) model states that cognitive and emotional responses provide unique variance on dependent variables. Given the uncertainty surrounding the structure of state reactance, a research question is put forth regarding the appropriate conceptualization of state reactance:

RQ1: When conceptualizing state reactance, should unfavorable cognitions and anger load on a latent variable?

Message Features Eliciting Reactance

Burgoon, Alvaro, Grandpre et al. (2002) suggest that communication scientists need to move away from asking questions about the nature of reactance, and instead focus on which message features elicit reactance. Additionally, due to the

oversimplification of message features, Dillard and Shen (2004) encouraged researchers to discontinue measuring messages as a unidimensional phenomenon. Instead, they challenged researchers to measure specific reactance-eliciting message features. In direct response to this charge, three specific message features are examined in this manuscript: threat-to-choice, vivid, and explicit language. These three message features were selected because each makes the persuasive intent of the source obvious, which in turn should enhance the likelihood of reactance according to PRT (Brehm, 1966, Brehm, & Brehm, 1981). Below, each of the three message features is explicated.

Threat-to-Choice Language

In the PRT literature, threatening messages are frequently characterized by forceful and pressuring language, commonly referred to as threat-to-choice language (see Burgoon, Alvaro, Broneck, et al. 2002; Dillard & Shen, 2004; Grandpre et al., 2003; Stephenson & Quick, 2004). Examples of threat-to-choice language include, "You simply cannot deny all the evidence," and "If you are at all reasonable, you will agree that these are serious issues." In comparison, low-threat language examples include, "There is pretty good evidence," and "Most people would agree that these issues are a fairly considerable problem." It is not difficult to see how, when compared to the second set of statements above, the first set of statements employ language perceived as overly paternalistic and dogmatic. In this section, the research on the use of high-threat-to-choice language is reviewed followed by a discussion on how this message feature is perceived by individuals, particularly adolescents and young adults.

There is an abundance of research suggesting that messages perceived as threatening one's freedom to choose elicit reactance (Burgoon, Alvaro, Broneck et al., 2002; Dillard & Shen, 2004; Grandpre et al., 2003; Stephenson & Quick, 2004). For example, Reich and Robertson's (1979) study on the persuasiveness of anti-litter messages found that stronger demands such as "don't litter" and "don't you dare litter" produced more littering than non-threatening messages on pool safety (Reich & Robertson, 1979). More recently, health communication scholars tested the persuasiveness of using high-threat-to-choice language in health messages in promoting a variety of health behaviors (Dillard & Shen, 2004; Stephenson & Quick, 2004). Dillard and Shen (2004) tested the effectiveness of binge-drinking and flossing ads featuring high- and low-threat language. Their results indicate that undergraduate participants exposed to the high-threat-to-choice condition reported significantly more unfavorable thoughts and anger than participants exposed to the low-threat-to-choice messages in both the binge drinking and flossing context. Additionally, Stephenson and Quick (2004) found that college students experienced more anger and fewer positive cognitions following exposure to high-threat-to-choice condom ads when compared to low-threat-to-choice ads. In sum, the take home messages from these studies is to avoid using high-threat-to-choice messages altogether when attempting to persuade individuals to engage in healthy behaviors.

In fact, a recent report by Henriksen et al. (2004) examined the language embedded in anti-smoking ads sponsored by the tobacco industry including Phillip Morris and Lorillard compared to ads sponsored by non-smoking entities such as the

"truth" ads. Interestingly, they discovered that ads sponsored by the tobacco industry featured more threat-to-choice language than ads produced by non-smoking groups. For example, phrases such as "Buy our product. It will kill you." "Think. Don't smoke." and "Tobacco is whacko if you're a teen" were featured in ads produced by the tobacco industry. In addition to discovering the use of threatening language, Henriksen et al. (2004) had 832 ninth and tenth graders view five ads. As predicted, Henriksen et al. found that participants with high trait reactance evaluated youth smoking prevention ads produced by the tobacco industry less favorably, expressed greater curiosity about smoking, and were more sympathetic toward cigarette companies than low reactance adolescents. As argued by Henriksen et al. (2004), it is plausible that the use of threat-to-choice language by the tobacco industry explains the ineffectiveness of these ads in dissuading tobacco use among adolescents.

Messages perceived to be deceptive or threatening are likely to be interpreted as a manipulation attempt, and consequently will result in feelings of resentment and anger by the receiver toward the threatening agent (Janis & Mann, 1977). Thus, given the expectation of health ads, individuals, particularly adolescents and young adults, are likely to respond favorably to low-threat-to choice ads that grant them the autonomy they so strongly desire while resenting high-threat-to choice ads perceived to be manipulative in nature (Burgoon et al., 2002; Grandpre et al., 2003; Janis & Mann, 1977).

However, the level of resentment experienced by message recipients is largely dependent upon their perception of the threat as being manipulative or rational and

justified (Janis & Mann, 1977). Existing research suggests that adolescents perceive public service announcements to be preachy in nature, therefore raising some doubt that campaigners will be able to successfully employ high-threat-to-choice language when striving to persuade adolescents and young adults in particularly (Austin, 1995; M. Burgoon, Alvaro, Broneck et al., 2002; Siegel & J. Burgoon, 2002). According to Brehm (1966), any communication or behavior that presents a threat to one's freedom is likely to elicit reactance. Therefore, a public service announcement containing pressuring, forceful, and dogmatic language will be more likely to elicit reactance than messages without the aforementioned features. Therefore, two hypotheses are put forth regarding threat-to-choice language and reactance.

H1: High-threat-to-choice language will elicit significantly more reactance than low-threat-to-choice language.

H2: Messages perceived to contain threat-to-choice language will be positively associated with reactance.

Vivid Language

One message feature receiving scholarly attention with regards to its impact on persuasiveness is the use of vivid language. "Information may be described as vivid, that is, as likely to attract and hold our attention and to excite the imagination, to the extent that it is: (a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal or spatial way" (Nisbett & Ross, 1980, p. 45). In other words, vivid language makes it easier for individuals to picture or imagine the material presented within the message (Keller & Block, 1997). As a result, vivid language is

more likely to evoke emotional responses when compared to non-vivid language (Zillmann & Brosius, 2000). In the present section, the use of vivid language within the health context is discussed, research in favor of and against the "vividness effect" is summarized, moderators impacting the persuasiveness of vivid language are explored, and a discussion of how vivid language will elicit reactance is promulgated.

Vivid language is frequently employed in public service announcements where the objective is often to dissuade individuals from engaging in risky behaviors through the use of fear appeals. For example, vivid language admonishing against the dangers of not using sunscreen reads as follows: overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer (Stephenson & Witte, 2001). To the contrary, an example of non-vivid language promoting the use of sunscreen reads as follows: overexposure to the sun leads to skin injuries, skin disease, and in general, declining health. The use of vivid language in health public service announcements is grounded in the logic that vivid messages elicit fear, which will subsequently enhance the persuasiveness of the message (Witte, 1992; 1994).

However, despite the widespread use of this particular message feature, research does not consistently demonstrate a positive association between vivid language and persuasion. Some researchers argue that vivid language can enhance the accessibility of information (Busselle & Shrum, 2003; Collins, Taylor, Wood, & Thompson, 1988), while others find no difference whatsoever (see Taylor & Thompson, 1982). In general, research fails to present a consistent picture of the persuasiveness of vivid language. On

one hand, some research suggests that vivid language enhances the persuasiveness of a message (Shedler & Manis, 1986; Smith & Shaffer, 2000). In particular, Smith and Shaffer (2000) discovered that vivid imagery congruent with the argument enhanced the persuasiveness of the message, whereas vivid images that were incongruent with the argument hindered persuasive goals. However, it should be noted that their evidence for a vividness effect only occurred when participants' motivation to process the message was low. In a two-study experiment, Collins, Taylor, Wood, and Thompson (1988) provide additional evidence in favor of the persuasiveness of vivid language. Specifically, these researchers found that college students rated vivid messages as more persuasive than the same messages presented in a non-vivid manner. Additionally, Collins et al. (1988) found that participants (a) recall vivid messages more accurately than non-vivid messages and (b) feel that vivid messages are more effective at persuading themselves and others than non-vivid messages.

On the other hand, despite several reports demonstrating a vividness effect, Taylor and Thompson's (1982) review of more than two-dozen vividness studies concluded that the vividness effect was weak and untenable. Along with their review, more recent research suggests that vivid language hinders persuasive outcomes (Frey & Eagly, 1993; Rothenberg, 1991). For example, Frey and Eagly (1993) discovered that vivid language interferes with cognitive processing thus consequently reducing the memorability and persuasiveness of these messages. Meanwhile others have found no difference in persuasion regardless of the presence of vivid or non-vivid language (Edell

& Staelin, 1983). In sum, after reviewing the literature examining the persuasiveness of vivid language, generalizable conclusions are difficult to draw.

The ambiguity surrounding the persuasiveness of vivid language prompted researchers to discover those conditions where vivid language enhances persuasion within the health context (Block & Keller, 1997; Rook, 1987; Stephenson & Witte, 1998). Block and Keller (1997) conducted two experiments to test the interaction between language vividness and self efficacy within the context of sexually transmitted diseases and skin cancer. Their results indicate that vivid language is more persuasive when participants believed that they could follow the recommendations presented within the message. However, the effectiveness of vivid language disappeared when self efficacy was low. Additionally, Block and Keller (1997) found that participants with high self efficacy generated more message-related thoughts and more positive thoughts following exposure to vivid messages compared to those viewing non-vivid messages. In addition to self efficacy impacting the persuasiveness of vivid messages, Rook (1987) found that perceived vulnerability moderated the persuasiveness of an osteoporosis health message on women. Specifically, she discovered that the use of vivid language was more persuasive for younger women compared to their older counterparts. Rook (1987) concluded that vivid messages are only persuasive when perceived vulnerability is low. In sum, these studies indicate that vivid messages are effective when participants maintain high self efficacy and perceive themselves to be invulnerable to the health threat.

Although there is little agreement as to the persuasiveness of vivid language, the sheer number of public service announcements that employ this message feature begs researchers to examine the relationship between vivid language and reactance. For one, we know that vivid language evokes more emotions than non-vivid language, although this emotional arousal is not always negative (Zillmann & Brosius, 2000). Second, we know that vivid language is likely to draw more attention to the health threat, which subsequently makes the persuasive intent of the source more transparent. Following a lucid, yet vivid, description of the aversive consequences associated with performing an unhealthy behavior, reactance is likely to be aroused.

The first principle of PRT states that reactance can only be aroused if a person believes he or she has freedom over a particular outcome. Within the context of health campaigns, arguably most individuals feel that their decision to engage in healthy and unhealthy behaviors rests on their shoulders. With that said, PRT also asserts that a positive association exists between reactance arousal and the number of threats present within a particular message. As stated above, vivid messages highlight the argument being advanced within a message. Therefore, as the number of vivid language features increases, it logically follows that argument clarity will simultaneously increase. As argument clarity increases, then the persuasive intent, also referred to as a threat (see Brehm, 1966; Brehm & Brehm, 1981), likewise becomes apparent. Transparent messages that feature vivid language are likely to apply pressure to audiences regarding the acceptability of the argument being advanced. Brehm (1966) argues that whenever

individuals feel a message is attempting to pressure them to behave in a certain manner, then reactance is likely to occur.

H3: Messages with vivid language will elicit significantly more reactance than messages with non-vivid language.

H4: Messages perceived to be vivid in nature will be positively associated with reactance.

Explicit Language

Explicitness is defined as "the degree to which the message source makes her or his intentions transparent in the message itself" (Dillard et al., 1997, p. 300). Explicit messages are blunt, delivered in a straightforward manner (Ross & Rossner, 1989). Nystrand and Wiemelt (1991) argued that explicit language leaves no doubt about its possible meaning. In other words, explicit language reveals the source's goals, and in some instances, draws the conclusion for the message recipient in an unambiguous or direct manner (Dillard et al., 1995; Hovland & Mandell, 1952; O'Keefe, 1998, O'Keefe, 1997). To the contrary, implicit language requires more guesswork by the audience. Implicit language either omits the conclusion altogether, or, presents the conclusion ambiguously (O'Keefe, 1997). For example, "drinking responsibly means no more than 5 drinks on one occasion if you are a man and no more than 4 drinks on one occasion if you are a woman" is an example of explicit language because the number of drinks is unambiguously stated. To the contrary, the same message stated implicitly is as follows, "drinking responsibly means that you know your own limits when it comes to how much alcohol you are going to consume on one occasion." With a definition of explicitness

provided and an example of explicit and implicit language illustrated, below the literature pertaining to the persuasiveness of argument and conclusion explicitness is reviewed.

The majority of the research on message explicitness presents a clear picture about the persuasiveness of explicit messages (Hovland & Mandell, 1952; O'Keefe, 1997; O'Keefe, 1998). In fact, O'Keefe (1997) suggests that message explicitness is the "normative ideal" in argumentation (p. 1). The rationale in support of message explicitness is that explicit speech opens the door for message scrutiny by the receiver. O'Keefe (1998) examined three message variations of explicitness including information-source citation, completeness of the argument, and quantitative specificity. O'Keefe's meta-analyses of 27 studies revealed a positive association between argument explicitness and persuasiveness ($r = .12$, $p < .001$) (O'Keefe, 1998). Two meta-analyses provide similar evidence for the effectiveness of conclusion explicitness. First, O'Keefe's meta-analyses of 14 studies, respectively, revealed a positive association between conclusion explicitness and persuasiveness ($r = .12$, $p < .001$) (O'Keefe, 1997). Cruz (1998) provides further support for explicit conclusions. Following Cruz's (1998) meta-analysis of seven studies, he found that explicit conclusions are more persuasive than implicit conclusions ($r = .05$). These findings are consistent with McGuire (1969), who stated, "In communication, it appears, it is not sufficient to lead the horse to the water; one must also push his head underneath to get him to drink" (p. 209).

Inconsistencies between O'Keefe (1997; 1998) and Cruz's (1998) meta-analysis on the effectiveness of language explicitness and PRTs predictions about language

explicitness are discussed below. O'Keefe and Cruz's work provides empirical support in favor of using explicit speech within specific contexts such as courtroom debate. To the contrast, research conducted using PRT as a theoretical framework finds that explicit speech is an ineffective strategy in enhancing message persuasiveness (Burgoon, Alvaro, Broneck et al., 2002; Grandpre et al., 2003). Perhaps one explanation for this inconsistency rests in the incongruous contexts in which the persuasiveness of language explicitness is evaluated. Early research on language explicitness was tested within the context of debate. Thus, messages were evaluated in terms of how they were presented, both verbally and nonverbally (Cathcart, 1955). In debate, it is essential for debaters to unequivocally present their case in order to be judged as logical and competent. However, within other contexts such as public service announcements, individuals desire the freedom to compose and evaluate their own arguments.

Two recent studies tested the effectiveness of using explicit messages in attempts to persuade adolescents to abstain from unhealthy behaviors (Burgoon, Alvaro, Broneck et al., 2002; Grandpre et al., 2003). First, while testing the effectiveness of interactive media in delivering substance abuse prevention messages, Burgoon, Alvaro, Broneck, et al. (2002) measured the effectiveness, as deemed by 4^{th}, 7^{th}, and 10^{th} graders, of messages using implicit (left conclusion up to message recipient) or explicit (conclusion stated by message source) language in warning against the aversive effects of smoking cigarettes and using illicit drugs such as inhalants and marijuana. Their results revealed that implicit messages were rated more positive, trustworthy, and less controlling than explicit messages. Additionally, explicit messages aroused negative attitudes in

participants as well as expressed intent to try the admonished substance in the future compared to participants exposed to implicit messages. Burgoon, Alvaro, Broneck et al. (2002) concluded, "adolescents are significantly more accepting of *implicit* antidrug messages that emphasize some freedom of choice than of explicit messages that tell them what to do" (p. 80).

Similarly, Grandpre et al. (2003) presented anti-smoking messages to youth in 4^{th}, 7^{th}, and 10^{th} grades. Their results indicated that implicit messages received more positive evaluations and more favorable source evaluations than explicit messages. However, no significant differences emerged between implicit and explicit messages with regard to intent, intention to smoke in the next year, might try a cigarette soon, or if a friend offered a cigarette (Grandpre et al., 2003). Taken together, the results from both studies provide strong evidence in favor of implicit messages that leave conclusions up to the message receiver rather than explicit messages with clearly drawn conclusions.

Composing and evaluating a persuasive argument resonates with PRT assumptions. A major assumption behind Brehm's (1966) PRT is that individuals cherish their ability to choose among alternative choices. Thus, in accordance with PRT and the recent research conducted by Burgoon, Alvaro, Broneck et al. (2002) and Grandpre et al. (2003), whenever individuals feel that an argument is stripping them from a particular freedom, then reactance will be aroused (Brehm, 1966; Brehm & Brehm, 1981). In the present study, explicit language is operationalized as containing specific recommendations advocating appropriate behaviors. For example, an explicit exercise message encourages individuals "to exercise 5 days a week for 30 minutes a

day of moderate intensity." To the contrary, an implicit message simply advocates participation in "a weekly exercise routine." The former explicitly states the quantity and intensity of exercise required whereas the latter avoids specifics and instead leaves the quantity and intensity of exercise required to the audience. In accordance with PRT, explicit language constitutes a threat and implicit language promotes choice. Following this rationale, health messages that incorporate explicit language will arouse reactance.

H5: Messages using explicit language will elicit significantly more reactance than messages incorporating implicit language.

H6: Messages perceived to be explicit in nature will be positively associated with reactance.

Brehm's (1966) third principal states that as the number of threats increase, the magnitude of reactance also increases. With that said, the more message features that are perceived as threats within a message, the greater the reactance arousal by message receivers. Therefore, messages featuring a combination of explicit, vivid, and threat-to-choice language admonishing against certain health behaviors should elicit greater reactance than messages featuring less than two of the aforementioned message features. In other words, a public service announcement containing high-threat-to-choice, vivid, and explicit language should elicit significantly more reactance than a message containing low-threat-to-choice, non-vivid, and implicit language. Although Brehm's (1966) third principle has not received much scholarly attention, the following hypothesis is put forth:

H7: The magnitude of reactance arousal will increase as the number of freedom-threatening language features present within the message increases.

Hypotheses 2, 4, and 6 are pictured in Figure 1.1.

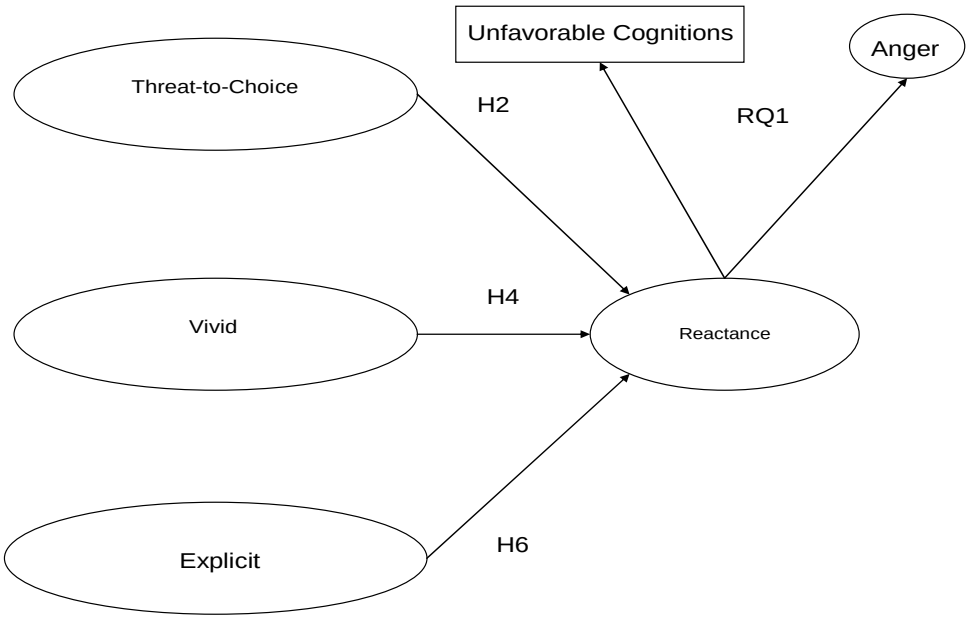

Figure 1.1. Message Features and Reactance.

Although each of the aforementioned message features provides an abundance of research possibilities, the RPM articulates the outcomes associated with reactance as stated by Brehm and Brehm (1981) as well.

Reactance Restoration

Brehm and Brehm (1981) suggest the possibility that motivationally aroused individuals will restore their threatened freedom directly or indirectly. Direct restoration

occurs whenever people exercise a threatened freedom by expressing their independence (a) behaviorally, (b) cognitively, or (c) emotionally in a manner opposite the threat, referred to as "Boomerang" in the RRS. Direct restoration also occurs when an individual exercises a related freedom instead of the freedom specifically threatened, called "Related Boomerang" in the RRS. Conversely, indirect restoration occurs by vicariously observing others engage in the forbidden behavior (Brehm, 1966; Burgoon, Alvaro, Grandpre et al., 2002; Donnell et al., 2001), identified as "Vicarious Boomerang" in the RRS. Previous PRT research examines direct restoration by assessing attitudes (Dillard & Shen, 2004; Grandpre et al., 2003; Rains & Mitchell-Turner, 2004; Stephenson & Quick, 2004), behavioral intentions (Bensley & Wu, 1991; Burgoon, Alvaro, Broneck et al., 2002; Dillard & Shen, 2004; Grandpre et al., 2003), message evaluation (Grandpre et al., 2003), and source evaluation (Burgoon, Alvaro, Broneck et al., 2002).

Reactance Restoration Scale (RRS)

Currently, no other measure exists to assess the relationship between reactance and direct and indirect restoration. In fact, present research measuring reactance restoration is only concerned with boomerang effects. Equally unsettling is that restoration is commonly measured using standard outcome variables such as attitudes and behavioral intentions. There is little doubt that attitudes and behavioral intentions represent a valid and reliable measure of message persuasiveness and are fruitful within the business, communication, and social psychology literature (see Hale, Householder, & Greene, 2002). However, these constructs do not conceptualize a motivational state

of reactance and are inappropriate measures of reactance, as conceptualized by Brehm (1966). In short, the RRS, which is advanced in this dissertation, is the first scale advanced to measure reactance restoration consistent with the work of Brehm (1966), as a motivational state.

Three additional reasons exist for advancing the RRS. First, the RRS offers some consistency to the measurement of reactance outcomes. Second, the RRS provides a reliable and valid instrument to measure the impact of reactance. Third, the RRS contains multiple items thus allowing the removal of measurement error, as with other constructs measured using latent variables, when modeling the outcomes associated with reactance due to the assessment of multi-item latent variables (Holbert & Stephenson, 2002; Stephenson & Holbert, 2003). The RRS consists of three scales: (a) Boomerang, (b) Related Boomerang, and (c) Vicarious Boomerang.

PRT states that as threat attractiveness increases, the desire to engage in the admonished behavior increases (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981). In fact, reactance arousal is related to an enhanced attractiveness of specific attitudes, behaviors, beliefs, and values (see Pennebaker et al., 1979). In sum, "reactance arousal has been shown to produce a clear and consistently documented increment in relative attractiveness" for the threatened or removed freedom (Brehm & Brehm, 1981, p. 108). Although the relationship between reactance arousal and motivation to restore a threatened freedom has never been tested empirically, Brehm's (1966) writing suggests a positive association will exist. In accordance with PRT, the following three hypotheses are put forth:

H8: Reactance arousal will be positively associated with "Boomerang" effects.

H9: Reactance arousal will be positively associated with "Related Boomerang" effects.

H10: Reactance arousal will be positively associated with "Vicarious Boomerang" effects.

Hypotheses 8 through 10 are pictured in Figure 1.2.

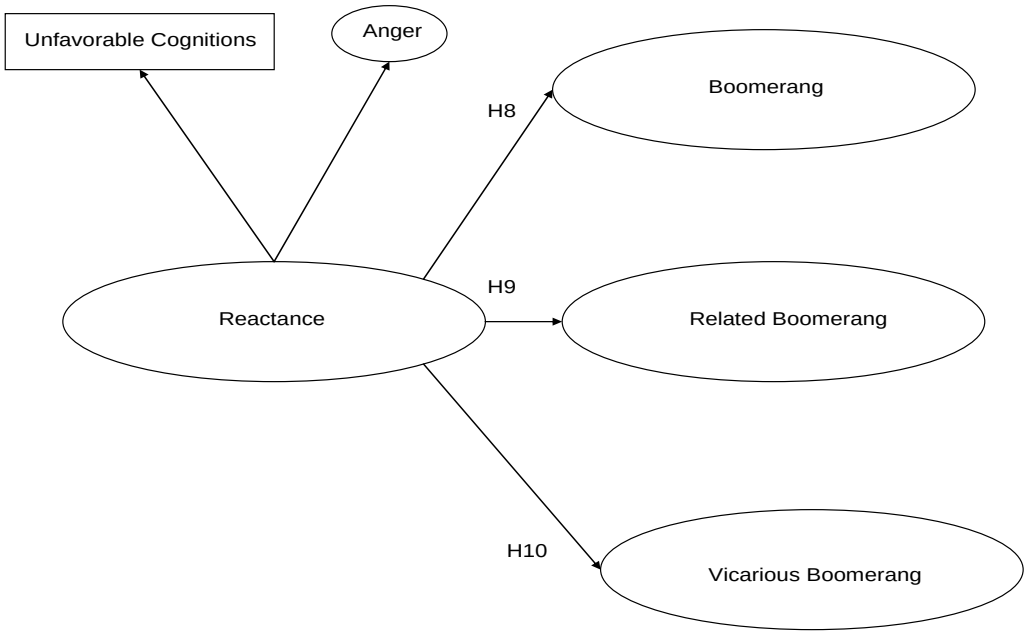

Figure 1.2. Reactance Restoration.

Following the tests of three specific message features impact on reactance and a close examination of reactance outcomes, the RPM describes how involvement moderates the relationship between reactance inducing message features and state reactance.

Issue Involvement

The amount and nature of message elaboration varies depending on individual factors such as ability and motivation (Chaiken, 1980; Petty & Cacioppo, 1986). Ability is comprised of an individual's competence to process a message and his or her knowledge on the particular topic. On the other hand, motivation is determined primarily by an individual's need for cognition and his or her involvement with the message (Booth-Butterfield & Welbourne, 2002; Chaiken, 1980; Petty & Cacioppo, 1986; Petty & Wegener, 1999). The RPM is concerned with how involvement affects message processing. Therefore, competence, knowledge, and need for cognition will not be discussed any further. To follow, issue involvement is defined and attention to how issue involvement impacts the processing of persuasive messages is discussed.

With the exception of attitudes, involvement receives more attention than any other concept within a typical persuasion textbook (Perloff, 2003). Issue involvement is defined as "the motivational state induced by an association between an activated attitude and some aspect of the self-concept" (Johnson & Eagly, 1989, p. 293). Although different conceptualizations of involvement exist within the literature (see Johnson & Eagly, 1989; 1990; Maio & Olson, 1995; Slater, 1997), there is little doubt that issue involvement is an important moderating variable influencing how individuals

process persuasive messages (Chaiken, 1980; Petty & Cacioppo, 1986). Specifically, when issue involvement is low, individuals often rely on peripheral or heuristics cues to render judgment on a particular message (Chaiken, 1980; Petty & Cacioppo, 1986). Accordingly, when involvement is low, peripheral or heuristic cues (such as an attractive source) often induce change without necessitating scrutiny of the message (Chaiken, 1980; Petty & Cacioppo, 1986). Persuasive outcomes following peripheral or heuristic processing are often unstable and short lived (Petty & Cacioppo, 1986). Conversely, when message involvement is high, individuals process messages centrally or systematically and are more likely to elaborate on the arguments embedded within a message (Chaiken, 1980; Petty & Cacioppo, 1986; Petty & Cacioppo, 1979).

For example, a study conducted by Rothman and Schwarz (1998) found that involvement moderated the relationship between ease-of-retrieval experiences on perceptions of heart disease risks. Specifically, they found that individuals with low involvement relied on experienced ease in recalling relevant risk behaviors when making vulnerability judgments, while those with high involvement relied on content from the message (Rothman & Schwarz, 1998). In sum, existing research suggests that involvement moderates the amount of message elaboration (Chaiken, 1980; Petty & Cacioppo, 1986).

One result of high issue involvement is the tendency to engage in biased or top-down processing (Petty & Cacioppo, 1986). Put another way, Chaiken and Stangor (1987) argue that individuals highly vested in a particular topic often engage in closed-minded processing. Biased processing occurs when a person's initial attitude becomes a

more important schema in guiding cognitive processing than arguments embedded within the message (Petty & Cacioppo, 1986). Individuals engaging in biased processing often assimilate toward belief-congruent thoughts rather than elaborate on incongruent arguments. Specifically, biased processing occurs as a (a) reactance motive (i.e., preference towards choices that are restricted), (b) balance motives (i.e., adopt the position of a liked source), (c) impression management (i.e., people will hold position that they feel will be ingratiating), or (d) self affirmation (i.e., people choose choice that will make them feel the best about themselves) (Chaiken, 1980; Petty & Cacioppo, 1986).

Research suggests that individuals maintain certain reasons for scrutinizing particular messages including defense, accuracy, and impression motivation (Chaiken, 1980; Petty & Cacioppo, 1986; Slater, 1997). Defense motivation assumes that people maintain a desire to hold attitudes, beliefs, and values that are congruent with their vested interests or self concept (Todorov, Chaiken, & Henderson, 2002). Along these lines, in extending the theoretical scope of the ELM, Slater (1997) puts forth testable hypotheses for defense motivations that span multiple message genres including educational, entertainment, and news content as well as traditional genres such as advertisements. According to Slater (1997), individuals with high issue involvement maintain two types of motivations for centrally or systematically processing a message. First, individuals may process belief-congruent messages to reinforce their current value systems, commonly referred to as value-affirmative processing (Slater, 2002). Second, individuals may centrally or systematically process incongruent-belief messages as an

opportunity to defend existing beliefs and refute opposing beliefs, commonly referred to as value-protective processing (Slater & Rouner, 1996). For example, an avid weightlifter exposed to a message advocating the benefits of a weekly exercise program might carefully process this message to buttress his or her beliefs, attitudes, and behaviors concerning exercise. On the other hand, a person who detests exercising may meticulously scrutinize the message to rehearse currently held beliefs or an opportunity to derive personal satisfaction by refuting the message (Slater, 1997). In short, Slater (2002) suggests that individuals will centrally or systematically process messages that are congruent and incongruent with their beliefs. Both value-affirmative and value-protective processing resonates with Chaiken's (1980) conceptualization of defense motivation and both have received empirical support within the scholarly literature (Slater & Rouner, 1992; Slater & Rouner, 1996).

In addition to defense motivation, the HSM states that individuals possess accuracy and impression motivations as well. Accuracy motivations assume that individuals maintain a desire to hold accurate attitudes, beliefs, and values. For example, a desire to learn the appropriate amount of exercise or nutrients to digest daily might serve as a catalyst to systematic processing. The third motivating factor that often elicits central or systematic processing is our yearning to impress others. Impression motivations assume that individuals have a strong desire to process a message when there is high probability for future social interactions related to message content. According to the HSM, an individual may experience any combination of these three motivations simultaneously while processing a message (Chaiken, 1980; Todorov,

Chaiken, & Henderson, 2002). In sum, individuals maintain specific motivations to process certain messages centrally or systematically while processing other messages peripherally or heuristically.

The second principle of PRT speaks to how issue involvement can impact the arousal of psychological reactance following exposure to freedom-threatening stimuli. Specifically, PRT states that as the importance of the threatened or eliminated freedom increases, the magnitude of state reactance will increase (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981). This principle has received empirical support within the literature (Bensley & Wu, 1991; Burgoon, Alvaro, Broneck et al., 2002; Grandpre et al., 2003). Additionally, research from the ELM and HSM demonstrates that when issue involvement is high, messages are processed centrally or systematically because individuals are motivated to absorb the message, albeit for different purposes (Chaiken, 1980; Petty & Cacioppo, 1986; Petty & Cacioppo, 1979; Slater, 1997). Therefore, in situations where issue involvement is high, the probability of biased processing occurring significantly increases (Chaiken, 1980). In situations where issue involvement is high and biased processing are present, messages featuring explicit arguments, vivid description of consequences, and threat-to-choice language should exacerbate the magnitude of reactance as a result of closer message scrutiny. Taken altogether, the RPM puts forth the following hypothesis:

H11: Issue involvement will moderate the relationships between reactance inducing message features, state reactance, and reactance restoration with a stronger positive relationship emerging for individuals with high issue involvement.

In sum, the RPM sets out to (a) accurately conceptualize reactance as a motivational state, (b) identify message features that elicit reactance, (c) empirically measure how reactance is restored directly and/or indirectly, and (d) understand the role of issue involvement on message processing of reactance-inducing messages. The model in its entirety is visually presented below in Figure 1.3.

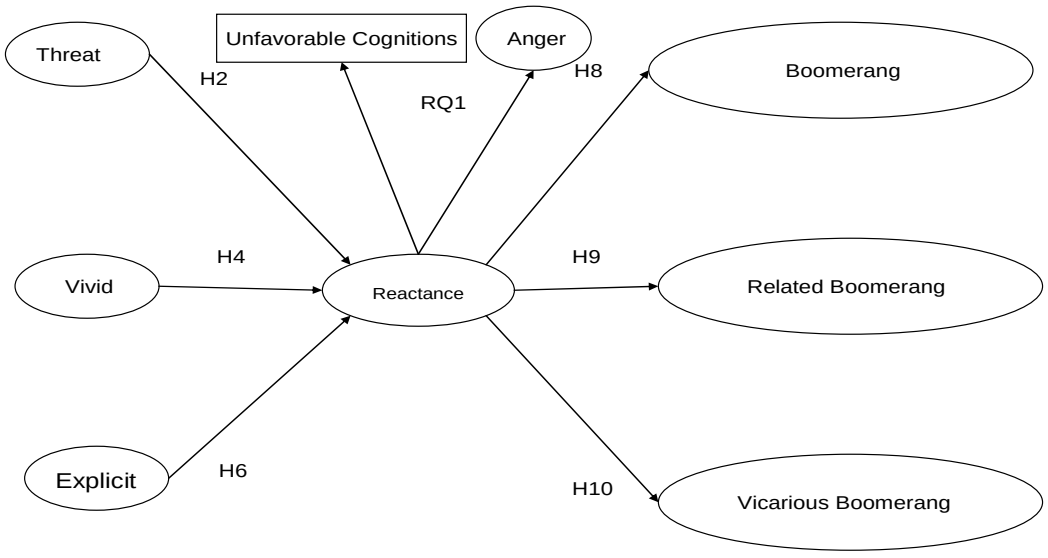

Figure 1.3. The Reactance Processing Model.

The hypotheses and proposed model will be tested in a study that varies the three message features within a controlled experimental design. The next section, the method, describes the (a) factor structure for the measurement of the three message features and the manipulation check for the pretest and (b) participants and procedures, experimental protocol, and the measures used for both the pretest and main study.

CHAPTER II

METHOD

Pretest

Procedures and Participants

A pretest was conducted to validate the three message features contained in the print messages. A 2 (explicit, implicit) X 2 (vivid, non-vivid) X 2 (high-threat-to-choice language, low-threat-to-choice language) posttest-only experimental design was employed.

Participants were recruited from an undergraduate communication course and received extra credit for participating in the study. The age range for the 222 participants was 18 to 34 (M = 20.42, SD = 1.70). The majority of participants, 84.7%, identified themselves as White or Caucasian, while 11.8% were Hispanic or Latino, 3.0% were African American, and .5% were of Asian descent. Most participants, 66.5%, were female.

Message Design

For the pretest, each participant received three different print messages. One message admonished against alcohol over consumption, a second advocated for participation in a weekly exercise routine, and the third encouraged the use of sunscreen. After reading the first print message, participants indicated if the message featured (a) high threat-to-choice language (4 items); (b) vivid language in discussing the consequences associated with not performing the advocated behavior (9 items); and (c)

explicit recommendations (5 items). This procedure was repeated for the second and third message.

Print messages were developed using a combination of the three message features. Certain messages contained explicit recommendations, vivid descriptions of consequences, and high-threat-to-choice language whereas other messages contained implicit recommendations, non-vivid descriptions of consequences, and low-threat-to-choice language. In all, there were eight different combinations of these three message features for each context (alcohol, exercise, and sunscreen). All 24 print messages were approximately 165 words in length (see Appendix A). To methodologically control for an ordering effect, 192 different ordering sequences of the print messages was employed. The information for each these message features was derived from previous research as well as current websites sponsored by the Center for Disease Control and the American Cancer Society (Stephenson & Witte, 1998; Wechseler et al., 2003).

Threat-to-Choice Language

Threat-to-choice language is exemplified by the use of threatening, pressuring, and opinionated language designed to force readers to comply with the message. The following is an example of a high-threat-to-choice message, "As you can see, the choice is crystal clear: you simply must participate in a weekly exercising routine in order for you to live a much healthier life!" Alternatively, low-threat-to-choice language features less dogmatic and forceful language that is designed to encourage choice. For example, "As you can see, we will leave the conclusion up to you regarding your participation in a

weekly exercise program: by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life."

Vivid Language

Vivid language is conceptualized as concrete and imagery-provoking messages that enable readers to more easily picture or imagine the material being presented (Keller & Brock, 1997; Nisbett & Ross, 1980). To the contrary, non-vivid messages contain language designed to *not* provoke mental representations of the material being presented. For example, "overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer" provides a description of a vivid message (Stephenson & Witte, 1998). In contrast, an example of non-vivid language promoting the use of sunscreen reads: "overexposure to the sun leads to skin injuries, skin disease, and in general, declining health." Vivid language is operationalized as articulating the consequences associated with (a) consuming too much alcohol in one setting, (b) not participating in an exercise routine, and (c) not using sunscreen when exposed to the sun. Conversely, non-vivid language contained general descriptions of the consequences associated with not engaging in the advocated behaviors.

Explicit Language

Explicit messages contain arguments put forth in a straightforward manner, whereas implicit arguments require more guesswork from the reader (Nystrand & Wiemelt, 1991; O'Keefe, 1998; Ross & Rossner, 1989). An example of explicit language is: "drinking responsibly means no more than 5 drinks on one occasion if you are a man and no more than 4 drinks on one occasion if you are a woman." To the

contrary, stated implicitly, “drinking responsibly means that you know your own limits when it comes to how much alcohol you are going to consume on one occasion.” The former is explicit because the number of drinks is unambiguously stated whereas the latter is vague in articulating the appropriate number of drinks to consume in one setting. Explicit language was operationalized as the appropriate (a) number of alcoholic drinks to consume during one setting, (b) amount of exercise to engage in per week, and the (c) minimum SPF sunscreen to use when exposed to direct sunlight for an extended period of time.

Measures

Threat-to-Choice Language

Threat-to-choice language was measured with eight items on a 7-point strongly agree/strongly disagree scale: (a) This message made me feel like I have no choice in determining [how much alcohol I drink/how much exercise I do/the appropriate sunscreen SPF level for me], (b) This message made me feel like I have no control in determining [how much alcohol I drink/how much exercise I do/the appropriate sunscreen SPF level for me], (c) This message made me feel like I do not have the freedom to choose [how much alcohol I drink/how much exercise I do/the appropriate sunscreen SPF level for me], (d) This message tried to make the decision for me, (e) This message tried to manipulate me, (f) This message tried to pressure me, (g) This message threatened my freedom to choose, and (h) This message contained opinionated language.

Vivid Language

Vividness was assessed using the following stem, "In the message you just read, I felt the description of the consequences of [drinking too much alcohol/not exercising/not using the appropriate sunscreen SPF level] was…" Using semantic differential scales on a 7-point continuum, vividness was appraised with the following anchor points: not sensational-sensational, not vivid-vivid, not graphic-graphic, pleasant-gruesome, dull-colorful, and weak-strong. Also, participants responded to the following two stems, "In the message you just read, picturing the consequences associated with [drinking too much alcohol/not exercising/not using the appropriate sunscreen SPF level] was…" and "In the message you just read, imagining the consequences associated with [drinking too much alcohol/not exercising/not using the appropriate sunscreen SPF level] was…" Semantic differential scales on a 7-point continuum with the following endpoints were used: not very easily pictured-easily pictured and not very easily imagined-easily imagined.

Explicit Language

Explicitness was assessed using the following stem, "In the message you just read, do you feel the recommendation about [how much alcohol to drink/how much exercise to do/the appropriate sunscreen SPF level to use] was…" Explicitness was measured using semantic differential scales on a 7-point continuum with the following anchor points: nonspecific-specific, vague-exact, ambiguous-precise, and general-clear-cut. In addition, participants responded to the following stem, "This health message about [alcohol/exercise/sunscreen] contained specific recommendations regarding the

appropriate [amount of alcohol to drink/amount of exercise/sunscreen SPF level to use]," for which responses were given on a 7-point Likert scale (1 = *no*, 7 = *yes*).

Factor Analysis

All the items above were subject to an exploratory factor analysis on pretest data was performed using Principal Axis factor extraction, promax rotation with Kaiser normalizations, and a convergence rotation of 25 iterations. The purpose of this factor analysis was to empirically determine which items clung together to form a reliable measure of explicit, vivid, and threat-to-choice language.

For the alcohol print message, five factors emerged with eigenvalues of 7.08, 4.33, 2.93, 1.21, and 1.07. The first factor was labeled "Explicit Language" and includes all five of the explicitness items listed on page 54. The second factor was labeled "Threat-to-Choice Language - Message" and includes the last five threat-to-choice items listed in the threat-to-choice measures on page 53. The label for this factor stems from the generality of the items (i.e., this message tried to pressure me). As opposed to Threat-to-Choice Personal, this factor appears to reflect the language contained within the message. The third factor was labeled "Vivid Language" and includes the first six (of eight) vividness items recorded on page 54. The items loading on the third factor describe the vividness of the message. The fourth factor was labeled "Threat-to-Choice Language - Personal" and includes the first three threat-to-choice items listed on page 53. This label was derived from the nature of the three items comprising this factor. Each of the items clearly asks if the participant personally has choice or control in choosing a specific course of action. Rather than focus on the message, the items

comprising this factor place an emphasis on personal choice. The fifth factor was labeled "Imagined Consequences" and includes the last two vividness items on page 54. These items ask the participants whether or not they can imagine or picture the consequences associated with not performing the advocated behavior. To measure the internal consistency of each factor, Cronbach coefficients alpha were calculated as .94, .92, .88, .94, and .91 for Factors I, II, III, IV, and V, respectively. Table 2.1 displays the pattern matrix indicating loadings of variables on the five factors as well as the percentage of total variance explained by each (see Appendix C). The five factors were moderately correlated as indicated in Table 2.2 (see Appendix C).

For the exercise print message, four factors emerged with eigenvalues of 7.12, 4.47, 3.45, and 1.21. The first factor was labeled "Vivid Language" and includes all eight of the vividness items. The second factor was labeled "Explicit Language" and includes all five explicit items. The third factor was labeled "Threat-to- Choice Language - General" and includes the last five threat-to-choice items. The fourth factor was labeled "Threat-to-Choice Language - Personal" and includes the first three threat-to-choice items. To measure the internal consistency of each factor, Cronbach coefficients alpha were calculated as .93, .95, .92, and .93 for Factors I, II, III, and IV, respectively. Table 2.3 displays the pattern matrix indicating loadings of variables on the four factors as well as the percentage of total variance explained by each (see Appendix C). Small to moderate correlations among the four factors appeared as indicated in Table 2.4 (see Appendix C).

For the sunscreen print message, four factors emerged with eigenvalues of 7.63, 4.21, 3.59, and 1.23. The first factor was labeled "Vivid Language" and includes all eight of the vividness items. The second factor was labeled "Explicit Language" and includes all five explicit items. The third factor was labeled "Threat-to- Choice Language - General" and includes the last five threat-to-choice items. The fourth factor was labeled "Threat-to-Choice Language - Personal" and includes the first three threat-to-choice items. To measure the internal consistency of each factor, Cronbach coefficients alpha were calculated as .91, .96, .90, and .94 for Factors I, II, III, and IV, respectively. Table 2.5 displays the pattern matrix indicating loadings of variables on the four factors as well as the percentage of total variance explained by each (see Appendix C). The four factors were moderately correlated as indicated in Table 2.6 (see Appendix C).

In sum, across the three message contexts, four factors consistently emerged including (a) Explicit Language, (b) Vivid Language, (c) Threat-to-Choice Language General, and (d) Threat-to-Choice Language Personal. However, for the alcohol print message, the Vivid Language factor was bifurcated into two separate factors including Vivid Language and Imagined Consequences. Perhaps vivid language was split into two factors for the alcohol print message because participants could more easily visualize the consequences associated with alcohol overconsumption compared to the other two contexts. Evidence of reduced academic performance, regretful sexual experiences, and harm to others as a result of drinking too much alcohol on one occasion is ubiquitous on most college campuses.

Manipulation Check

The manipulation check was performed in order to assess whether or not participants perceived the three message features embedded within each health message: explicit, vivid, and threat-to-choice language. Evaluations were subject to a 2 (high-threat-to-choice language, low-threat-to-choice language) X 2 (vivid, non-vivid) X 2 (explicit, implicit) posttest-only design. A factorial ANOVA reporting significant main effects and 2- and 3-way interactions for threat-to-choice, vivid, and explicit, language are presented below for the alcohol, exercise, and sunscreen messages.

Threat-to-Choice Language

For the alcohol health messages, the threat-to-choice manipulation yielded a significant main effect for perceived threat-to-choice language, F (1, 214) = 24.81, $p <$ .001, partial η^2 = .10, where participants presented with a message featuring high-threat-to-choice language (M = 2.87, SE = .15) reported greater perceptions of freedom restrictions than participants presented with a message containing low-threat-to-choice language (M = 1.83, SE = .15). Additionally, the threat-to-choice manipulation also generated a significant main effect for perceived explicit language, F (1, 214) = 10.41, p = .001, partial η^2 = .05. Participants exposed to alcohol messages containing explicit language (M = 2.69, SE= .15) indicated that their freedom had been threatened more compared to individuals receiving implicit language (M = 2.01, SE = .15). No significant 2- or 3-way interactions were present. Effect sizes (r) of explicit, vivid, and threat-to-choice language on the threat-to-choice manipulation were .21, .03, and .31. Although the effect size for threat-to-choice language is the largest of the three, the

significant main effect on threat-to-choice language by explicit language suggests a confounding effect, which hinders the precision of the manipulation.

The threat-to-choice manipulation for exercise yielded a significant main effect for perceived threat-to-choice language, F (1, 211) = 27.81, $p < .001$, partial $\eta^2 = .12$, with participants receiving messages featuring high-threat-to-choice language ($M = 3.14$, $SE = .15$) perceiving these message to be more freedom threatening than participants receiving the low-threat-to-choice language message ($M = 2.03$, $SE = .15$). However, a significant 2-way interaction occurred between threat-to-choice and explicit language, F (1, 211) = 4.99, $p < .05$, partial $\eta^2 = 02$. Beyond manipulations, effect sizes (r) of explicit, vivid, and threat-to-choice language on the threat-to-choice language manipulation were .06, .08, and .34.

The threat-to-choice manipulation for sunscreen generated a significant main effect for threat-to-choice language, F (1, 213) = 20.43, $p < .001$, partial $\eta^2 = .09$. Participants exposed to high-threat-to-choice language ($M = 2.75$, $SE = .14$) believed that their freedom had been threatened compared to individuals exposed to the low-threat-to-choice message ($M = 1.85$, $SE = .14$). No significant 2- or 3-way interactions were found. Effect sizes (r) of explicit, vivid, and threat-to-choice language on the threat-to-choice language manipulation were .04, .10, and .29.

Vivid Language

The vivid language manipulation for alcohol consumption generated a significant main effect for perceived vivid language, F (1, 214) = 5.98, $p < .05$, partial $\eta^2 = .03$. Participants presented with vivid language ($M = 4.75$, $SE = .10$) perceived the message

to contain greater levels of vivid language than participants presented with non-vivid language ($M = 4.40$, $SE = .10$). Similarly, participants presented with explicit language ($M = 4.73$, $SE = .10$) reported greater perceived vividness than participants presented with implicit language ($M = 4.42$, $SE = .10$), $F\ (1, 214) = 4.84$, $p < .05$, partial $\eta^2 = .02$. Additionally, participants exposed to high-threat-to-choice language ($M = 4.76$, $SE = .10$) perceived the message to contain more vivid language compared to participants receiving the low-threat-to-choice message ($M = 4.39$, $SE = .10$), $F\ (1, 214) = 6.92$, $p < .01$, partial $\eta^2 = .03$. No significant 2- or 3-way interactions were present. The effect sizes (r) of explicit, vivid, and threat-to-choice language on the language vividness manipulation were .15, .16, and .17. As evidenced by these findings, the significant main effects on vivid language by explicit and threat-to-choice language, as well as the equivalent effect sizes, suggests a confounding effect, which is problematic.

The vivid language manipulation for exercise produced a significant main effect for perceived vivid language, $F\ (1, 211) = 58.11$, $p < .001$, partial $\eta^2 = .22$. Participants receiving messages with vivid language ($M = 5.06$, $SE = .12$) perceived the message to be more vivid compared to those reading messages with non-vivid language ($M = 3.81$, $SE = .12$). No other main effects or 2- or 3-way interactions were significant. The effect sizes (r) of explicit, vivid, and threat-to-choice language on the language vividness manipulation were .08, .46, and .11 respectively.

For the sunscreen messages, the factorial ANOVA revealed the vividness manipulation yielded a significant main effect for perceived vivid language, $F\ (1, 214) = 175.68$, $p < .001$, partial $\eta^2 = .25$. Participants presented with vivid language ($M = 5.35$,

SE = .11) perceived the message to be more vivid than those presented with the non-vivid message (*M* = 3.99, *SE* = .11). No other main effects or 2- or 3-way interactions were significant. The effect sizes (*r*) of explicit, vivid, and threat-to-choice language on the language vividness manipulation were .03, .50, and .02 respectively.

Explicit Language

For the alcohol messages, analyses revealed that the language explicitness manipulation yielded a significant main effect on the explicit language measure, F (1, 214) = 175.68, $p < .001$, partial $\eta^2 = .45$, with participants presented with explicit language (*M* = 6.10, *SE* = .13) reporting greater perceived explicitness than participants presented with implicit language (*M* = 3.73, *SE* = .13). No other main effects or 2- or 3-way interactions were found. The effect sizes (*r*) of explicit, vivid, and threat-to-choice language on perceived language explicitness were .67, .01, and .00.

For the exercise health messages, language explicitness yielded a significant main effect on the explicit language measure, F (1, 211) = 95.34, $p < .001$, partial η^2 = .31, with participants presented with explicit language (*M* = 5.65, *SE* = .15) reporting greater perceived explicitness than participants presented with implicit language (*M* = 3.67, *SE* = .14). The factorial ANOVA analysis also demonstrated that exercise messages featuring high-threat-to-choice language approached significance on perceived language explicitness, F (1, 211) = 3.46, $p = .06$, partial $\eta^2 = .02$. Specifically, participants exposed to high threat-to-choice language (*M* = 4.85, *SE* = .14) experienced significantly greater reactance than those exposed to the low threat-to-choice exercise message (*M* = 4.48, *SE* = .14). No other main effects were significant. However, a 2-

way interaction between the explicit manipulation and vivid language manipulation was significant on the explicit language measure, F (1, 211) = 4.08, p = .05, partial η^2 = .02. Given the significant interaction that occurred between explicit and vivid language on perceptions of explicit language, vivid language may present a confounding factor when interpreting these results. The effect sizes (r) of explicit, vivid, and threat-to-choice language on the language explicitness manipulation were .54, .03, and .10.

The sunscreen health message brought about a significant main effect of language explicitness on the explicit language measure, F (1, 213) = 42.03, $p < .001$, partial η^2 = .17. The factorial ANOVA analysis showed that participants reading sunscreen messages with explicit language level (M = 5.08, SE = .17) reported greater perceived explicitness compared to participants receiving messages with implicit language (M = 3.54, SE = .17). No other main effects or 2- or 3-way interactions were significant. The effect sizes (r) of explicit, vivid, and threat-to-choice language on the language explicitness manipulation were .40, .05, and .01 respectively.

To summarize, the purpose of the pretest was to (a) pretest three message components and (b) determine the factor structure for the measurement of the three message features. The results from this investigation indicate that explicit, vivid, and threat-to-choice language can be reliably measured. Also, the pretest revealed that each of the message features was accurately perceived by the participants. Although for certain message features additional main effects and 2- or 3-way interactions were present, the effect sizes (r) suggest that an effective manipulation was accomplished, thus minimizing the likelihood of potential confounds in the messages.

Of the three message contexts, the alcohol print messages yielded the most inconsistent factor structure and contained the greatest number of main effects and interactions. This suggests that the alcohol manipulations were not pure and as a result cannot be used in the main study. Subsequently, alcohol messages were not as pure as the other two. Therefore, they were not used in the main study. Only exercise and sunscreen messages were presented to participants in the main study.

Main Study

Participants and Procedure

An experimental 2 (implicit vs. explicit) X 2 (non-vivid vs. vivid) X 2 (low-threat-to-choice language vs. high-threat-to-choice language) posttest only design was employed to test the proposed hypotheses. Undergraduate students (N = 550) enrolled in communication courses at Texas A & M University participated in this study to earn extra credit. Participants were primarily between the ages of 18-21 (M = 20, SD = 1.92). Of the participants, the majority were white or Caucasian (81.4%), while 10.1% were Hispanic, 5.3% were of Asian descent, 2.4% were African American, and .7% indicated their ethnicity was not specified in the previous categories. Females represented the majority of the sample (61.1%).

In addition to general demographic items, participants also reported their current knowledge and behaviors regarding exercise and sunscreen usage. Regarding knowledge of the recommended amount of exercise per week, participants reported that 125.52 (SD = 82.45) minutes was the recommended amount of minutes per week compared to the actual recommended amount of 150 minutes (Center for Disease Control, 2003). On average, participants reported participating in intensive exercise, defined as physical activity that increases heart rate and causes sweating for more than 30 minutes, between 0 and 50 times throughout the month (M = 11.56, SD = 8.33). When asked the minimum level of Sun Protection Factor level to use when exposed to direct sunlight (for greater than 15 minutes), the participants recorded a range of responses from 0 to 1000 (M = 31.07, SD = 43.94), compared to the recommended SPF

level of 15 or higher (American Cancer Society, 2005). Additionally, when exposed to direct sunlight for an extended period of time (greater than 15 minutes) last summer, participants indicated modest sunscreen use (38.31%).

After obtaining consent, participants responded to personality measures including the Hong and Faedda's (1996) Trait Reactance Scale (see Appendix B), Wallston, Wallston and Deveillis's (1978) Multidimensional Health Locus of Control, and Stephenson et al. (2003) Sensation Seeking Scale (BSSS-4). Following the completion of these personality measures, participants indicated their (a) knowledge, (b) beliefs, (c) behaviors, (d) issue involvement, (e) severity, (f) susceptibility, (g) perceived behavioral control, and (h) family history pertaining to both exercise and sunscreen usage.

After completing the measures, participants read two print messages. Following exposure to the first print message, participants completed the thought-listing task for 90 seconds (Petty & Cacioppo, 1986). Immediately following the thought-listing technique, participants indicated whether each thought was favorable, unfavorable, or neutral. Next, participants indicated the degree of state anger they felt while reading the print message as well as completed the manipulation check items. After that, individuals read the message a second time. Following their second exposure to the message, participants completed the Reactance Restoration Scale along with attitudinal and behavioral intention measures. This procedure was repeated for the second print message. Lastly, participants completed a brief demographic questionnaire (sex, age, and ethnicity) before concluding the experiment. See Figure 2.1 below for entire the experimental protocol.

1. Random assignment to condition
2. Informed consent
3. Participants complete (a) personality, (b) issue involvement, (c) knowledge, (d) beliefs, (e) behaviors, (f) issue involvement, (g) severity, (h) susceptibility, (i) perceived behavioral control, and (j) family history measures pertaining to exercise and sunscreen usage.
4. Read message #1 (approximately 60 seconds)
5. Thought-listing (90 seconds)
6. Affective response, manipulation check
7. Read message for second time
8. RRS, attitudinal and behavioral intention measures
9. Repeat steps 4 through 8 for print message #2

Figure 2.1. Experimental Protocol.

Print Messages

Participants were presented with two print messages. The print messages advocated participation in a weekly exercise routine and the proper use of sunscreen when directly exposed to the sun. The print messages were identical to the messages used in the pretest. As in the pretest, both exercise and sunscreen messages contained eight versions (See Appendix B). Approximately 70 participants were randomly assigned to each message, thus ensuring adequate power as discussed later in this

section. Lastly, in order to guard against an ordering effect or an effect due to the presentation of the messages, 16 orders were created.

Measures

During the present study, participants responded to a series of items assessing (a) personality, (b) issue involvement, (c) knowledge, (d) beliefs, (e) behaviors, (f) severity, (g) susceptibility, (h) perceived behavioral control, and (i) family history measures pertaining to exercise and sunscreen usage. However, in the section that follows, only the items that were used to answer the research questions and hypotheses are included. Specifically, the manipulation check items, issue involvement, state reactance, the Reactance Restoration Scale, and demographic items were used in the preceding analyses. Each of the measures is discussed below.

Manipulation Check

To check the effectiveness of the manipulations, participants completed a series of items that gauged individual perceptions of threat-to-choice, vividness, and explicitness. The items were the same as those employed in the pretest. For the exercise message, the manipulation check measures for threat-to-choice ($\alpha = .93$), vividness ($\alpha = .93$), and explicitness ($\alpha = .96$) achieved respectable reliabilities. Similarly, manipulation check measures for threat-to-choice ($\alpha = .91$), vividness ($\alpha = .94$), and explicitness ($\alpha = .98$) all obtained excellent reliabilities for the sunscreen messages.

Issue Involvement

Issue involvement was assessed using five items for both exercise and sunscreen usage. To assess issue involvement pertaining to exercise, the following five items were

employed: (a) “Exercise is a priority for me,” (b) “Exercise is important to me,” (c) “Exercise is personally relevant to me,” (d) “Exercise is not a significant concern of mine,” and “Exercise is never at the top of my mind.” Measuring each item on a 7-point scale (1 = *Strongly Disagree* and 7 = *Strongly Agree*), the exercise issue involvement measure obtained respectable reliability (α = .91).

Issue involvement with sunscreen usage was measured using the following five items: (a) “Using sunscreen when exposed to direct sunlight for an extended period of time (greater than 15 minutes) is a priority for me,” (b) “Using sunscreen when exposed to direct sunlight for an extended period of time (greater than 15 minutes) is important to me,” (c) “Using sunscreen when exposed to direct sunlight for an extended period of time (greater than 15 minutes) is personally relevant to me,” (d) “Using sunscreen when exposed to direct sunlight for an extended period of time (greater than 15 minutes) is not a significant concern of mine,” and “Using sunscreen when exposed to direct sunlight for an extended period of time (greater than 15 minutes) is never at the top of my mind.” Each item was measured with a 7-point response scale in which 1 = *Strongly Disagree* and 7 = *Strongly Agree*. Issue involvement for sunscreen usage (α = .93) also obtained respectable reliabilities.

State Reactance

State reactance was measured using both affective and cognitive assessments as outlined below.

Anger. Researchers assessing anger arousal commonly use four semantic-differential items on a 7-point scale where 1 = *None of this feeling* to 7 = *A great deal of*

this feeling (Dillard & Shen, 2004; Stephenson & Quick, 2004). The four items included irritated, angry, annoyed, and aggravated. Together, the four item index achieved high reliability for both the exercise ($\alpha = .94$) and sunscreen ($\alpha = .93$) messages.

Cognitive thoughts. Participants were given 90 seconds to write out whatever thoughts entered their mind while they were reading the print message. Once cognitive responses were obtained, participants identified each thought as either (a) favorable (in agreement with the message), (b) unfavorable (not in agreement with the message), or (c) neutral (neither in agreement or disagreement with the message). The total number of unfavorable thoughts was used as the cognitive component of state reactance.

Reactance Restoration Scale

Reactance restoration was evaluated with the Reactance Restoration Scale (RRS). The RRS consists of three questions: (a) "Right now, I am _____ to (exercise/use sunscreen the next time I am exposed to direct sunlight for an extended period of time (greater than 15 minutes))," (b) "Right now, I am _____ to be around others who (exercise/use sunscreen when they are exposed to direct sunlight for an extended period of time (greater than 15 minutes))," and (c) "Right now, I am _____ to do something totally unhealthy." Participants responded to each of these items on a 7-point continuum using semantic differential scales with the following anchor points: motivated-unmotivated, determined-not determined, encouraged-not encouraged, and inspired-not inspired.

An exploratory factor analysis on the RRS data was performed using Principal Axis extraction with promax rotation for the RRS scales. For both the exercise and

sunscreen print messages, three factors emerged using an eigenvalue of greater than 1 that were moderately correlated: (a) Motivation to not perform the advocated behavior, labeled "Boomerang," (b) Motivation to be around others who do not perform the advocated behavior, labeled "Vicarious Boomerang," and (c) Motivation to do something totally unhealthy, labeled "Related Boomerang." For the exercise print messages, three factors emerged with eigenvalues of 6.48, 2.73, and 1.24. The first factor, "Related Boomerang" ($\alpha = .96$) was correlated with the second factor, "Vicarious Boomerang" ($\alpha = .94$), ($r = .27$) and was highly correlated with the third factor, "Boomerang" ($\alpha = .94$) ($r = .42$). "Vicarious Boomerang" was strongly correlated with "Boomerang" ($r = .63$). The K-M-O sampling adequacy measure for the RRS was quite good (.88).

Similar findings emerged for the RRS with the sunscreen print messages. "Related Boomerang," the first factor was only slightly correlated with the second factor "Vicarious Boomerang" ($r = .07$) and was correlated with the third factor, "Boomerang" ($r = .21$). "Vicarious Boomerang" was strongly correlated with "Boomerang" ($r = .55$). For the sunscreen print messages, the K-M-O sampling adequacy measure was quite good for the RRS (.87). To measure the internal consistency of each factor, Cronbach coefficients alpha were calculated as .97, .96, and .93 for Factors I, II, and III, respectively. Table 2.7 and 2.8 displays the pattern matrix indicating loadings of variables on the three factors as well as the percentage of total variance explained by each for the exercise and print messages.

Demographic Measures

Participants provided their age, gender, education level, and ethnicity.

In Chapter III, attention to the results from the main study is provided. Specifically, (a) an argument for treating messages as fixed factors is advanced, (b) results of the manipulation check, (c) power analysis for SEM and ANOVA, (d) description of data analysis, and (e) the presentation of research questions and hypotheses.

CHAPTER III

RESULTS

Messages as Fixed Factors

Within the pretest and main study, multiple messages were used to test the RPM. Given that more than one message was used within these investigations, a researcher must decide whether to treat messages as fixed or random factors (Hunter, Hamilton, & Allen, 1989; Jackson & Brashers, 1994; Jackson, O'Keefe, Jacobs, & Brashers, 1989; Slater, 1991). A factor is treated as fixed whenever its levels represent the experimental manipulations of interest within a study (Jackson & Brashers, 1994). To the contrary, a factor is said to be random whenever its levels are drawn from a larger pool of existing levels. Jackson and Brashers (1994) put forth three criteria to implement when deciding whether a factor should be treated as fixed or random. First, a factor is said to be random if certain levels can be replaced with other acceptable levels without changing the theoretical importance of the study. For example, in the present study three message features (threat-to-choice, vivid, and explicit language) are tested to determine whether or not each individually or in combination with another, elicits psychological reactance. If any of these message features were replaced with another, such as argument quality, then the hypotheses for the study would change substantially. Thus, given the hypotheses put forth in this investigation, classifying threat-to-choice, vivid, and explicit language as fixed factors is reasonable.

Second, if a researcher seeks to generalize to other contexts not tested within an experiment, then random factors should be employed (Jackson & Brashers, 1994). The

argument in favor of utilizing multiple messages to augment the generalizability of findings when designing an experiment is well documented (Jackson, O'Keefe, Jacobs, & Brashers, 1989). The present study tests the aforementioned three message features within the context of sunscreen usage and exercise participation. However, sunscreen usage and exercise participation were selected arbitrarily from a host of other health problems that confront college students such as alcohol consumption, marijuana and tobacco usage, sexually-transmitted diseases, and so forth. Therefore, in order to generalize the findings from this study to other contexts, messages should be measured as a random factor (Jackson & Brashers, 1994). However, if the goal is not to generalize the findings beyond the context of sunscreen usage and exercise participation, then context should be measured as a fixed factor. Given the exploratory nature of this investigation, the ability to generalize the findings to other contexts is of little theoretical importance. Thus, treating context as a fixed factor is logical.

The third criteria states that if a researcher can draw a meaningful conclusion at each level of the factor, then treating a factor as fixed is appropriate (Jackson & Brashers, 1994). Given the significance of sunscreen usage (Allgower, Wardle, & Steptoe, 2001; American Cancer Society, 2005; Greene & Brinn, 2003; Mahler, Kulik, Gibbons, Gerrard, & Harrell, 2003) and exercise (Center for Disease Control, 2003; Finlay, Trafimow, & Villareal, 2002; Frank, Galuska, Elon, & Wright, 2004; Jones, Sinclair, & Courneya, 2003; Theodorakis, Papaioannou, & Karastogianidou, 2004) in the lives of college students, treating context as a fixed factor is preferable. The conclusions drawn from both contexts will produce meaningful and unique contributions. In

accordance with the criteria promulgated by Jackson and Brashers (1994), message features and context are treated as fixed factors for the present investigation.

Manipulation Check

The manipulation check was performed in order to assess whether or not participants were able to perceive the three specific message features that were embedded within each health message: threat-to-choice, vivid, and explicit language. Evaluations were subject to a 2 (explicit, implicit) X 2 (vivid, non-vivid) X 2 (high-threat-to-choice, low-threat-to-choice) posttest-only experimental design. Results from the factorial ANOVA analyses reporting significant main effects and 2- and 3-way interactions for threat-to-choice, vivid, and explicit language are presented below for both exercise and sunscreen messages. The print messages were validated in the pretest. However, by performing a manipulation check, the internal validity of the study is strengthened.

Threat-to-Choice Language

The threat-to-choice manipulation for exercise yielded a significant main effect for perceived threat-to-choice language, F (1, 541) = 132.14, $p < .001$, partial $\eta^2 = .20$, with participants perceiving exercise messages featuring high-threat-to-choice language (M = 3.46, SE= .09) to be more freedom threatening than participants receiving the low-threat-to-choice language message (M = 2.02, SE = .09). Two other main effects were detected even though they did not exist in the pretest. First, a significant main effect arose for vivid language, F (1, 541) = 38.99, $p < .05$, partial $\eta^2 = 03$. Individuals receiving a vivid exercise message (M = 3.01, SE =.09) perceived it to be significantly

more freedom threatening than those presented with non-vivid language (M = 2.47, SE = .09). Second, explicit language demonstrated a significant main effect for perceived threat-to-choice language, F (1, 541) = 5.08, $p < .05$, partial $\eta^2 = 01$, with participants perceiving messages featuring explicit language (M = 2.88, SE = .09) to be more freedom threatening than those exposed to exercise messages with implicit language (M = 2.60, SE = .09). This finding did not appear in the pretest. No significant 2- or 3-way interactions were present. Beyond manipulations, effect sizes (r) of explicit, vivid, and threat-to-choice language on the threat-to-choice language manipulation were .09, .16, and .44. Even though all three message features elicited a significant main effect on perceived threat-to-choice, which does enhance the likelihood of confounds hindering analysis, these effect sizes demonstrate that the manipulation was adequate.

The threat-to-choice manipulation for sunscreen generated a significant main effect for threat-to-choice language, F (1, 542) = 59.10, $p < .001$, partial $\eta^2 = .10$. Participants exposed to high-threat-to-choice language (M = 3.03, SE = .09) believed that their freedom had been threatened significantly more compared to individuals exposed to the low-threat-to-choice message (M = 2.08, SE = .09). In addition to a main effect for threat-to-choice language, language explicitness also resulted in a significant main effect for threat-to-choice language, F (1, 542) = 3.89, $p = .05$, partial $\eta^2 = .01$. Individuals exposed to a message with explicit language (M = 2.68, SE = .09) perceived it to be more freedom threatening than individuals exposed to messages using implicit language (M = 2.44, SE = .09). No other main effects or 2- or 3-way interactions appeared. Beyond the manipulation, effect sizes (r) of explicit, vivid, and threat-to-

choice language on the threat-to-choice language manipulation were .08, .07, and .31. Despite the risk of a potential confound due to the main effects finding for both threat-to-choice and explicit language, the effect sizes suggest that the manipulation was met. With that said, it is important to note that the means garnered in both the pretest and the main study were low. That is, even though a significant difference emerged, the mean for participants exposed to the high-threat-to-choice message was still below the scale midpoint.

Vivid Language

The vivid language manipulation for exercise produced a significant main effect for perceived vivid language, F (1, 542) = 210.14, $p < .001$, partial $\eta^2 = .28$. Participants receiving messages with vivid language ($M = 5.01$, $SE = .08$) perceived the message to be more vivid compared to those reading exercise messages with non-vivid language ($M = 3.31$, $SE = .08$). Additionally, a significant main effect for perceived vivid language was found for exercise messages containing threat-to-choice language, F (1, 542) = 21.12, $p < .001$, partial $\eta^2 = .04$. Individuals receiving messages with high threat-to-choice language ($M = 4.43$, $SE = .08$) perceived the message to be more vivid than those receiving a low threat-to-choice message ($M = 3.89$, $SE = .08$). Lastly, a significant 2-way interaction occurred between threat-to-choice and vivid language, F (1, 542) = 4.75, $p < .05$, partial $\eta^2 = 01$. No other significant main effects or 2- or 3-way interactions were present. The effect sizes (r) of explicit, vivid, and threat-to-choice language on the language vividness manipulation were .03, .52, and .17 respectively. Although the results may be confounded due to significant main effects on perceived message

vividness for both vivid and threat-to-choice language, the reported effect sizes (*r*) suggest that an effective manipulation of vivid language was accomplished.

For the sunscreen messages, the factorial ANOVA analysis revealed the vividness manipulation yielded a significant main effect for perceived vivid language, F (1, 542) = 275.66, $p < .001$, partial $\eta^2 = .34$. Participants presented with vivid language ($M = 5.33$, $SE = .08$) perceived the message to be more vivid than those presented with the non-vivid message ($M = 3.40$, $SE = .08$). As was the case for the exercise messages, a significant main effect for perceived vivid language appeared for sunscreen messages containing threat-to-choice language, F (1, 542) = 14.19, $p < .001$, partial $\eta^2 = .03$. Participants exposed to a high-threat-to-choice sunscreen message ($M = 4.58$, $SE = .08$) perceived the message to be more vivid than those presented with a low threat-to-choice message ($M = 4.15$, $SE = .08$). No significant 2- or 3-way interactions occurred between threat-to-choice and vivid language. The effect sizes (*r*) of explicit, vivid, and threat-to-choice language on the language vividness manipulation were .05, .57, and .12 respectively. Although the manipulation check was not as clean as desired, the effect sizes suggest that an effective manipulation was achieved.

Explicit Language

For the exercise health messages, language explicitness yielded a significant main effect on the explicit language measure, F (1, 542) = 346.06, $p < .001$, partial $\eta^2 = .39$, with participants presented with explicit language ($M = 5.57$, $SE = .09$) reporting greater perceived explicitness than participants presented with implicit language ($M = 3.17$, $SE = .09$). No other main effects or 2- or 3-way interactions were significant.

Beyond manipulations, the effect sizes (*r*) of explicit, vivid, and threat-to-choice language on the language explicitness manipulation were .62, -.04, and .06 respectively.

The sunscreen health message brought about a significant main effect on explicitness for the perceived explicitness, F (1, 542) = 672, $p < .001$, partial $\eta^2 = .55$. The factorial ANOVA analysis showed that participants reading sunscreen messages with explicit language regarding the appropriate sunscreen SPF level ($M = 5.91$, $SE = .09$) reported greater perceived explicitness compared to participants receiving messages with implicit language ($M = 2.63$, $SE = .09$). No other main effects were significant. However, a significant 2-way interaction occurred between threat-to-choice and explicit language, F (1, 542) = 6.37, $p < .05$, partial $\eta^2 = 01$. The effect sizes (*r*) of explicit, vivid, and threat-to-choice language on the language explicitness manipulation were .74, .05, and .01 respectively. Although a significant interaction occurred between threat-to-choice and explicit language, which could hinder the precision of the results, the reported effect sizes suggest that the manipulation was successful.

Power

The primary analyses for this investigation were Structural Equation Modeling (SEM) and Analysis of Variance (ANOVA). Given that the message features and context within this study are treated as fixed factors, then MacCallum, Browne, and Sugawara's (1996) and Cohen's (1988) standards of estimating power will be followed.

SEM

Power is not considered a barrier to this investigation. Following MacCallum et al. (1996), to achieve power of .80 for a model with df = 79 (the estimated df in the proposed model), the minimum *N* for a test of close fit is 154.

ANOVA

In estimating power for fixed-factor designs using ANOVA, four parameters are required including effect size, significance criteria, power, and sample size (Cohen, 1988). Whenever possible, effect size is determined by consulting prior research. Recently, a meta-analysis was conducted utilizing existing data from 48 health communication campaigns to determine the effectiveness of these promotional efforts (Snyder, 2001; Snyder & Hamilton, 2002). Their analysis determined that the average effect size across all behavior change campaigns was .09 (reported as *r*). Although research using PRT as a theoretical framework just recently emerged within the health campaign literature, research assessing the effectiveness of threat-to-choice language within health messages exists (Dillard & Shen, 2004; Grandpre et al., 2003; Stephenson & Quick, 2004). In these reports, specifically, the effect size of threat-to-choice language on thoughts range from .92 (reported as a *d*) to .20 (reported as η^2) (Dillard & Shen, 2004; Stephenson & Quick, 2004). Additionally, effect size of threat-to-choice language on state anger extend between .35 (reported as a *d*) to .21 (reported as η^2) (Dillard & Shen, 2004; Stephenson & Quick, 2004). Although not testing threat-to-choice language per se, Grandpre et al. (2003) discovered that the effect size of explicit language on message evaluation was quite low, $\eta^2 = .03$. Taken as a whole, the existing

research that tests the effectiveness of health campaigns in general, along with research applying PRT to the health campaign context, leads me to expect a medium effect size. A medium effect size for an F-test is equal to a Cohen's *f* of .25 (Cohen, 1988).

The remaining parameters that need to be determined when conducting a power analysis are alpha, beta, and sample size. The significance criterion, commonly referred to as alpha, is set at .05 in the present study. Following established conventions, beta is set at .80. Sample size is determined largely by the factorial design. In the present investigation, a 2 (explicit, implicit) X 2 (vivid, non-vivid) X 2 (high threat-to-choice, low threat-to-choice) posttest only factorial design was employed. Therefore, sample size is determined by the following equation: $\mu = (k-1)(r-1)(p-1)$ or $1 = (2-1)(2-1)(2-1)$. With a medium effect size ($f = .25$) expected in conjunction with alpha and beta levels set at their conventional standards of .05 and .80 respectively, approximately 28 participants are needed to obtain .80 power with alpha set at .05.

Data Analytic Strategy

SEM

Research questions 1 and hypotheses 2, 4, 6, 8, 9, 10, and 11 were tested using structural equation modeling using full-information maximum likelihood estimators in EQS 6.1 for Windows. For these analyses, reactance was specified as a latent variable comprised of two indicator variables, unfavorable cognitions and anger (Dillard & Shen, 2004). Message features were treated as hybrid variables comprised of their respective indicator variables, while anger, "Boomerang," "Related Boomerang," and "Vicarious Boomerang" were treated as latent composite variables (see Holbert & Stephenson,

2002; Stephenson & Holbert, 2003). As a result, error was extracted from these variables by setting their error term to (1 – coefficient alpha)*variance.

ANOVA

Data analytic strategy for hypotheses 1, 3, 5, and 7 were tested using a factorial analysis of variance. In each of these hypotheses, the message feature served as the independent variable and reactance, comprised of standard z scored unfavorable cognitions and state anger, was the dependent variable.

Structural Equation Modeling

Structural equation modeling was employed to test the validity of the RPM. To test the goodness of fit for the hypothesized models, the omnibus model (global) fit was evaluated using the chi square value, Comparative Fit Index (CFI), Standardized Root Mean Squared Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). When interpreting the chi square test, the models with lower values that are not significant represent a better fitting model. CFI values range from 0 to 1, with better overall fit indicated by higher values. Following Hu and Bentler (1999), CFI values of .95 or higher suggest a good fitting model. To the contrary, good fitting models achieve low scores on the SRMR and RMSEA. Hu and Bentler (1999) suggest cutoff values close to .08 for SRMR and .06 for RMSEA (see Holbert & Stephenson, 2002). The CFI, SRMR, and RMSEA are reported along with the chi square for the preceding models.

The two-step approach was used to assess model fit (Hoyle, 1995). First, the measurement model determined whether the indicator variables accurately measure the specified latent variable. Second, the structural model tested whether the relationships

among latent variables fit as hypothesized. Combining the measurement and structural model provides researchers with "a comprehensive statistical model that can be used to evaluate relations among variables that are free of measurement error" (Hoyle, 1995, p. 3). Once the omnibus model was tested, the hypotheses (local fit) were assessed by examining the standardized path coefficients with an established *p*-value of .05. The hypothesized paths between latent variables are discussed in the research questions and hypotheses to follow.

The hypothesized measurement model. The hypothesized measurement model consisted of eight observed variables comprising the threat-to-choice message feature, nine observed variables comprising the vivid message feature, and five observed variables comprising the explicit message feature. Unfortunately, this hypothesized model was not consistent with the data, largely due to the error terms wanting to load on more than one latent variable. Therefore, statistical considerations led to a reduction in the number of observed variables employed to comprise each message feature.

In the revised measurement model, threat-to-choice language was specified using the following three items: (a) This message made me feel like I have no choice in determining [how much exercise I do/the appropriate sunscreen SPF level for me], (b) This message made me feel like I have no control in determining [how much exercise I do/the appropriate sunscreen SPF level for me], (c) This message made me feel like I do not have the freedom to choose [how much exercise I do/the appropriate sunscreen SPF level for me]. Together, the three item index achieved good reliability for both the exercise ($\alpha = .93$) and sunscreen ($\alpha = .91$) messages.

Perception of message vividness was specified with: not sensational-sensational, not vivid-vivid, and not graphic-graphic. The three-item index achieved respectable reliability for both the exercise ($\alpha = .87$) and sunscreen ($\alpha = .89$) messages.

Language explicitness was specified with: nonspecific-specific, vague-exact, ambiguous-precise, and general-clear-cut. This four-item index obtained high reliability for both the exercise ($\alpha = .96$) and sunscreen ($\alpha = .98$) messages.

Exercise measurement model. The exercise measurement model was tested using structural equation modeling using full-information maximum likelihood estimators in EQS 6.1 for Windows. A covariance matrix was computed by EQS from the raw data, which was uploaded from an SPSS file. To provide some correction to multivariate normality, nine cases were deleted. Although a data set is said to be normal when achieving a Mardia's normalized estimate less than 3, the multivariate distributions remained slightly nonnormal, with Mardia's normalized estimate = 22.85. Nevertheless, West, Finch, and Curran (1995) argue that maximum likelihood estimators are robust to minor nonnormality violations.

The hypothesized exercise measurement model was consistent with the data, CFI = .99, SRMR = .037, and RMSEA = .043 (90% confidence interval of .032 to .053), χ^2 (73, $N = 550$) = 144.84, $p < .001$. A large sample size, often results in an oversensitive chi-square test. Hence, the measurement model fit the exercise data well. Table 3.1 displays the measurement model parameters for both exercise and sunscreen contexts (see Appendix C).

Exercise structural model. The exercise structural model was also consistent with the data, CFI = .99, SRMR = .05, and RMSEA = .045 (90% confidence interval of .036 to .055), χ^2 (79, N = 550) = 166.39, p < .001. The correlations, means, and standard deviations of the 15 variables used in the model are reported in Table 3.2 (see Appendix C). The obtained Results of this model are depicted in Figure 3.1.

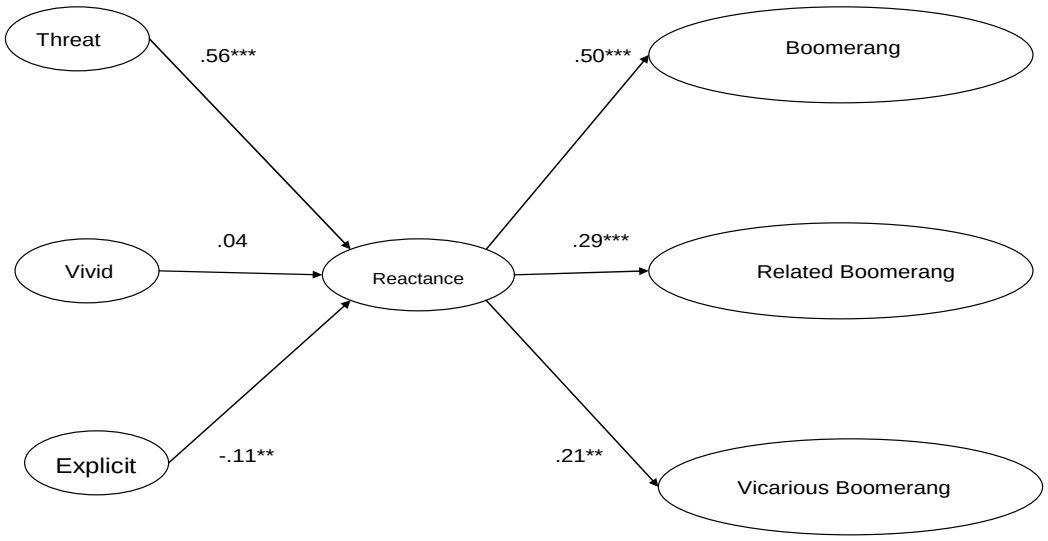

Figure 3.1. Exercise Structural Model.
* p < .05
**p < .01
***p < .001

Sunscreen measurement model. Similarly to the exercise measurement model, the sunscreen measurement model was also tested using structural equation modeling. To provide some correction to multivariate normality, 15 cases were deleted. The

multivariate distributions remained slightly nonnormal, with Mardia's normalized estimate = 19.74.

The same omnibus model (global) fit indexes were used to evaluate the measurement model for the sunscreen message. Similar to the exercise message, the hypothesized measurement model, was consistent with the data, CFI = .98, SRMR = .031, and RMSEA = .056 (90% confidence interval of .047 to .066), χ^2 (73, N = 535) = 195.58, p < .001.

Sunscreen structural model. The sunscreen structural model was also consistent with the data, CFI = .98, SRMR = .04, and RMSEA = .058 (90% confidence interval of .049 to .067), χ^2 (79, N = 535) = 223.25, p < .001. The correlations, means, and standard deviations of the 15 variables in the sunscreen structural model are reported in Table 3.3 (see Appendix C). Results of this model are depicted in Figure 3.2.

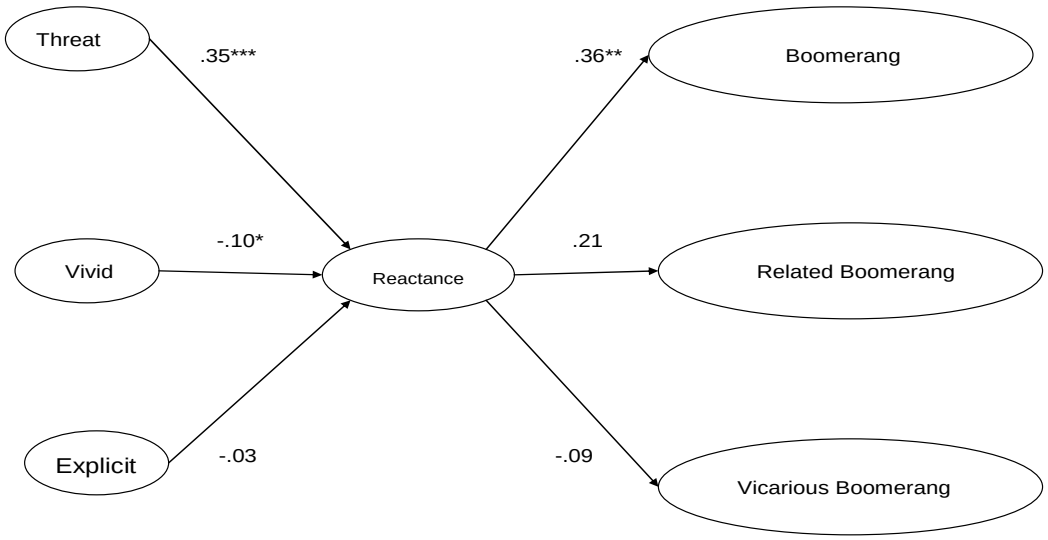

Figure 3.2. Sunscreen Structural Model.
* $p < .05$
** $p < .01$
***p < .001

RQ1: Operationalization of State Reactance

Research question one was concerned with the conceptualization of reactance. Existing research suggests that reactance is measured using unfavorable cognitions and anger (Dillard & Shen, 2004; Stephenson & Quick, 2004). However, these research lines differ as to whether or not unfavorable cognitions and anger load on reactance. The finding from this study provides empirical support for operationalizing reactance as a latent variable comprised of unfavorable thoughts and anger. Before assessing the association between unfavorable cognitions and anger, both items were standardized in order to place them on the same metric. For the exercise measurement model, the

relationships between unfavorable cognitions and reactance ($\beta = .59$, $p < .001$) and anger and reactance ($\beta = .91$, $p < .001$) loaded on the latent variable reactance. This finding was replicated in the sunscreen measurement model. Both unfavorable cognitions ($\beta = .51$, $p < .001$) and anger ($\beta = .91$, $p < .001$) loaded on reactance. Thus, the research question provides additional evidence in support of treating reactance as a latent variable comprised of unfavorable cognitions and anger.

H1: Threat-to-Choice Language and Reactance

The first hypothesis predicted that messages featuring high threat-to-choice language would elicit significantly more reactance than those containing low threat-to-choice language. For the exercise messages, the factorial custom model ANOVA analysis revealed that threat-to-choice language exerted a significant main effect on reactance, F (1, 546) = 90.23, $p < .001$, partial $\eta^2 = .14$. Specifically, participants presented with high threat-to-choice language (M =.32, SE = .05) reported greater reactance than participants presented messages with low threat-to-choice language (M = -.33, SE = .05). No 2- or 3-way interactions were present within the full factorial model for exercise messages. For sunscreen messages, the factorial custom model ANOVA analysis demonstrated that high threat-to-choice language brought about more reactance than low threat-to-choice language, F (1, 546) = 88.74, $p < .001$, partial $\eta^2 = .14$. Participants exposed to high threat-to-choice language (M = .32, SE = .05) experienced significantly more reactance than those receiving low threat-to-choice sunscreen language (M = -.31, SE = .05).

For the sunscreen messages, a significant 2-way interaction was found between threat-to-choice and vivid language using a full factorial model, F (1, 542) = 9.03, p < .01, partial η^2 = .02. Specifically, participants exposed to messages containing both high threat-to-choice and vivid language (M = .53, SE = .07) experienced significantly more reactance than participants exposed to high threat-to-choice and non-vivid language (M = .11, SE = .07), low threat-to-choice and non-vivid language (M = -.32, SE = .07), and low threat-to-choice and vivid language (M = -.30, SE = .07). Participants exposed to the high threat-to-choice with non-vivid language experienced significantly greater reactance than participants exposed to the low threat-to-choice with vivid language and the low threat-to-choice with non-vivid language conditions. No significant differences occurred between the low threat-to-choice and vivid language message and the low threat-to-choice and non-vivid language message. In sum, high threat-to-choice language elicited significantly more reactance in both exercise and sunscreen messages thus providing empirical support for the first hypothesis.

H2: Perceptions of Threat-to-Choice Language and Reactance

Hypothesis two predicted that messages perceived to contain threat-to-choice language would be positively associated with reactance. As illustrated in Figure 3.1, the relationships between perceptions that the message contained high threat-to-choice language and reactance was significant for both exercise (β = .56, p < .001) and for sunscreen (β = .35, p < .001). Therefore, hypothesis two was supported.

H3: Vivid Language and Reactance

The third hypothesis predicted that vivid language would elicit significantly more reactance than non-vivid language. For the exercise messages, the custom factorial ANOVA analysis revealed that vivid language demonstrated a significant main effect on reactance, F (1, 546) = 8.41, $p < .001$, partial $\eta^2 = .02$. Participants presented with vivid language ($M = .10$, $SE = .05$) reported greater reactance than participants presented with non-vivid language ($M = -.10$, $SE = .05$). This significant trend was replicated for the sunscreen message, F (1, 546) = 10.45, $p < .001$, partial $\eta^2 = .02$, where vivid language ($M = .11$, $SE = .05$) elicited greater reactance compared to the non-vivid language ($M = -.11$, $SE = .05$). The full factorial model revealed that no 2- or 3-way interactions were significant. Thus, hypothesis three was supported.

H4: Perceptions of Vivid Language and Reactance

Hypothesis four predicted that perceived vivid language describing the consequences associated with not exercising or not using sunscreen would be positively associated with reactance. As illustrated in Figure 3.1, the relationship between perceptions of message vividness and reactance was nonsignificant for the exercise message ($\beta = .04$). To the contrary, a significant negative relationship emerged between perceptions of message vividness and reactance for the sunscreen messages ($\beta = -.10$, $p < .05$). Given the inconsistent findings, the relationship between vividness perceptions and reactance remains tentative. Albeit inconsistent, this data does not support the predicted positive association between messages perceived to portray the vivid

consequences of not performing the advocated behavior and reactance but rather a negative relationship. Hence, H4 was not supported.

H5: Explicit Language and Reactance

The fifth hypothesis predicted that explicit recommendations would produce significantly more reactance than implicit messages. For the exercise messages, the factorial ANOVA analysis revealed that explicit language did not demonstrate a significant main effect on reactance, F (1, 546) = .01, p = .92. For the sunscreen messages, this nonsignificant finding was replicated, F (1, 546) = .30, p = .58. No two- or three-way interactions for either the exercise or sunscreen message were significant. In short, hypothesis five was disconfirmed.

H6: Perceptions of Explicit Language and Reactance

Hypothesis six predicted that messages perceived to be explicit in nature would be positively associated with reactance. As displayed in Figure 3.1, the relationship between perceptions of explicit language and reactance was significant for the exercise message (β = -.11, p < .01), albeit negative. To the contrary, no association emerged between perceptions of message explicitness and reactance for the sunscreen messages (β = -.03). Given the inconsistent findings, the relationship between perceptions of explicit recommendations and reactance remains tentative. Hypothesis six was not statistically significant.

H7: Additive Effect of Message Features

Hypothesis seven predicted that the magnitude of reactance arousal would increase as the number of freedom-threatening message components present within the

message increased. Put another way, a message containing high threat-to-choice, vivid, and explicit language will elicit greater reactance than those with high threat-to-choice, non-vivid, and implicit language because the former contains 3 while the latter contains only 1 freedom-threatening component. To conduct this analysis, the 8 message combinations were entered as the independent variable in a one-way ANOVA. A significant main effect for message features on reactance for both the exercise, F (7, 542) = 14.24, $p < .001$, partial $\eta^2 = .16$, and sunscreen message, F (7, 542) = 16.12, $p < .001$, partial $\eta^2 = .17$ was discovered. Post hoc tests showcase some intriguing findings regarding additive effects for the exercise messages. Specifically, messages containing high-threat to choice and vivid message features elicited the most reactance ($M = .50$, $SD = .95$) followed by messages containing only high threat-to-choice language ($M = .40$, $SD = .91$) for both exercise and sunscreen messages. Significant differences among the eight message conditions are presented in Table 3.4 (see Appendix C).

H8: Reactance and "Boomerang" Effects

The eighth hypothesis predicted that reactance arousal would be positively associated with a desire toward directly restoring the threatened behavior. This hypothesis was testing using structural equation modeling. As displayed in Figures 3.1 and 3.2, both the exercise and sunscreen models proved to fit the data well as evidenced by the overall fit statistics. For the exercise structural model, the relationships between reactance and "Boomerang" was strong for both the exercise ($\beta = .50$, $p < .001$) and sunscreen structural model ($\beta = .36$, $p < .01$). Therefore, given these findings, hypothesis eight was supported.

H9: Reactance and "Related Boomerang" Effects

The ninth hypothesis predicted that reactance arousal would be positively associated with a desire toward directly restoring the threatened behavior by doing some unhealthy other behavior. For the exercise structural model, the relationships between reactance and "Related Boomerang" was strong (β = .29, p < .001). This finding did not receive empirical verification in the sunscreen structural model (β = .21, p = n.s.). Thus, hypothesis nine is only partially supported.

H10: Reactance and "Vicarious Boomerang" Effects

Hypothesis 10 predicted that reactance arousal would be positively associated with a desire toward observing others perform the specific threat. For exercise, the relationships between reactance and "Vicarious Boomerang" was strong (β = .21, p < .01). However, this finding was not significant in the sunscreen structural model (β = .21, p = n.s.). Therefore, given the inconsistencies between models, hypothesis ten received only partial support.

H11: Issue Involvement and Reactance

The eleventh hypothesis predicted that issue involvement would moderate the relationships between reactance inducing message features, state reactance, and reactance restoration with a stronger positive relationship emerging for individuals with high issue involvement. This hypothesis required specifying and testing a new structural model. This procedure employed the multi-groups method of testing different models based on the moderating variable of interest, issue involvement (see Stephenson, 2003). Thus, before path models were estimated, median splits were employed to differentiate

high and low issue involvement within the sample. For exercise, participants with an issue involvement mean between 1 and 5.6 (on a 7-point scale) were classified as maintaining low involvement whereas individuals between 5.8 and 7 were characterized as possessing high issue involvement. For sunscreen, participants with an issue involvement mean between 1 and 3.8 (on a 7-point scale) were classified as maintaining low involvement whereas individuals between 4.0 and 7 were characterized as possessing high issue involvement.

In order to test hypothesis 11, a statistical test using unstandardized path coefficients and their respective standard errors was used to determine if path coefficients were statistically different between paths in the low and high issue involvement models (Cohen & Cohen, 1983). Specifically, a z-statistic is calculated by taking the difference of the two unstandardized path coefficients and divides it by the square root of the sum of the squared standard errors. The z-statistic tells whether or not the two path coefficients are statistically different. First the processing differences for high and low issue involvement regarding exercise are discussed followed by issue involvement concerning sunscreen usage.

High and low issue involvement exercise measurement model. Structural equation modeling using full-information maximum likelihood estimators in EQS 6.1 for Windows was employed to test the differences between the RPM for participants indicating high and low involvement with regards to exercise. A covariance matrix was computed by EQS from the raw data, which was uploaded from an SPSS file. To provide some correction to multivariate normality, three cases were deleted for the low

and one case for the high involvement samples. Although a data set is said to be normal when achieving a Mardia's normalized estimate less than 3, the multivariate distributions remained slightly nonnormal, with Mardia's normalized estimate of 12.97 for the low issue involvement sample and 20.54 for the high issue involvement sample. Table 3.5 displays the measurement model parameters for both high and low issue involvement (see Appendix C).

The hypothesized measurement model for the low issue involvement sample was consistent with the data, CFI = .97, SRMR = .044, and RMSEA = .067 (90% confidence interval of .052 to .081), χ^2 (74, N = 252) = 156.36, p < .001. Similarly, the hypothesized measurement model for the high issue involvement sample fit the data well, CFI = .98, SRMR = .043, and RMSEA = .051 (90% confidence interval of .036 to .066), χ^2 (73, N = 291) = 128.86, p < .001. Table 3.6 and Table 3.7 display the correlation matrix of observed variables within the low and high issue involvement structural models for exercise (see Appendix C).

High and low issue involvement exercise structural model. For the low issue involvement data set, the fit indices demonstrated a good fit, CFI = .97, SRMR = .067, and RMSEA = .068 (90% confidence interval of .054 to .082), χ^2 (80, N = 255) = 173.04, p < .001. Likewise, for the high issue involvement data set, the fit indices showed a good fit between the hypothesized model and the data chi-square goodness of fit test indicates that the data did not fit the model well, CFI = .98, SRMR = .049, and RMSEA = .051 (90% confidence interval of .036 to .064) χ^2 (79, N = 291) = 137.69, p < .001. The standardized beta coefficients are presented below in Figure 3.3.

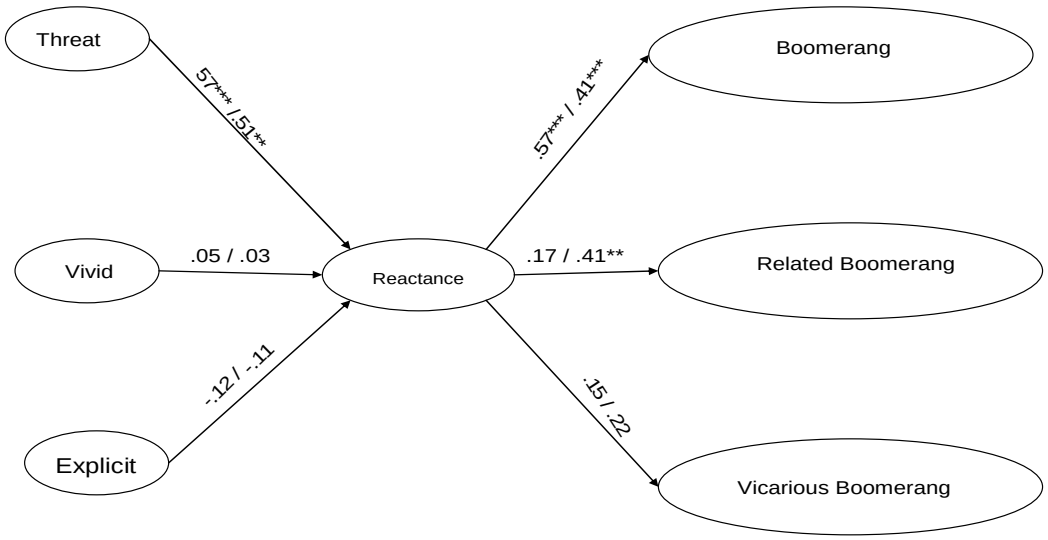

Figure 3.3: Exercise High and Low Issue Involvement Structural Model. Each coefficient to the left of the slash (/) is for the high issue involvement model; each coefficient to the right of the slash (/) is for the low issue involvement model.
* $p < .05$
** $p < .01$
*** $p < .001$

Hypothesis 11 predicted that the processing of reactance-inducing messages would lead to greater reactance and a stronger desire to restore a threatened freedom for individuals with high issue involvement compared to those with low issue involvement. For the exercise messages, of the six pairs of path coefficients, the results indicate that several paths were statistically significant, however none of the paths were statistically different between the high and low issue involvement models.

High and low issue involvement sunscreen measurement model. Again, structural equation modeling was employed to test the differences between the RPM for

participants with high and low issue involvement. To provide some correction to multivariate normality, three cases were deleted for the low and zero cases for the high involvement samples. Although a data set is said to be normal when achieving a Mardia's normalized estimate less than 3, the multivariate distributions remained slightly nonnormal, with Mardia's normalized estimate of 18.54 for the low issue involvement sample and 14.99 for the high issue involvement sample. Table 3.8 provides the measurement model parameters for both high and low issue involvement (see Appendix C).

The hypothesized measurement model for the low issue involvement sample was consistent with the data, CFI = .98, SRMR = .035, and RMSEA = .055 (90% confidence interval of .039 to .070), χ^2 (73, N = 261) = 130.41, p < .001. Similarly, the hypothesized measurement model for the high issue involvement sample fit the data well, CFI = .98, SRMR = .034, and RMSEA = .057 (90% confidence interval of .043 to .071), χ^2 (73, N = 283) = 140.59, p < .001. Table 3.9 and Table 3.10 display the correlation matrix of observed variables within the low and high issue involvement sunscreen structural model (see Appendix C).

High and low issue involvement sunscreen structural model. For low issue involvement, the hypothesized structural model was consistent with the data, CFI was .98, SRMR was .049, and RMSEA was .056 (90% confidence interval of .041 to .070), χ^2 (79, N = 261) = 143.55, p < .001. Likewise, for participants with high issue involvement, the data fit the model well, CFI = .98, SRMR = .041, and RMSEA = .058

(90% confidence interval of .044 to .071), χ^2 (79, N = 283) = 153.36, p < .001. The standardized beta coefficients are presented visually below in Figure 3.4.

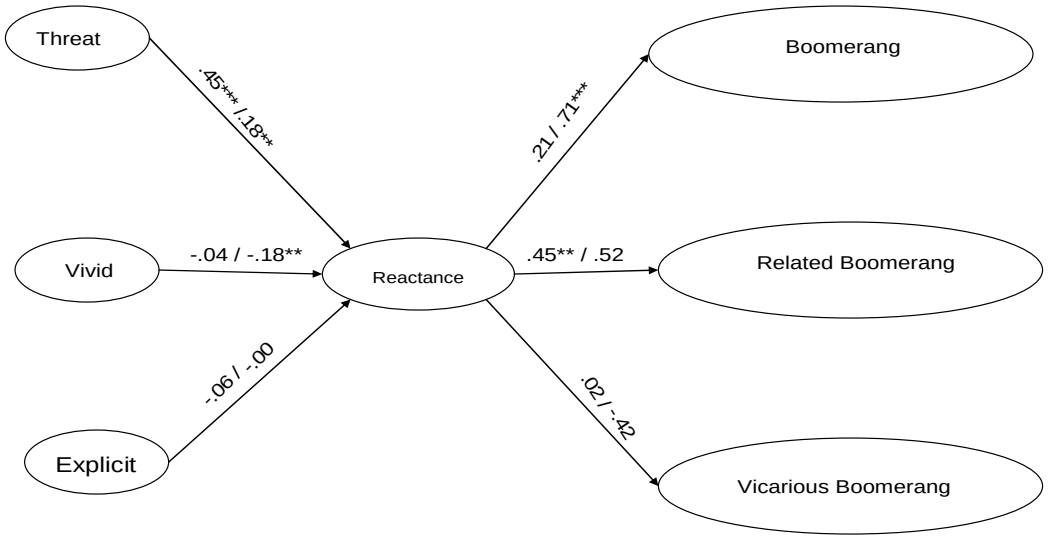

Figure 3.4: Sunscreen High and Low Issue Involvement Structural Model. Each coefficient to the left of the slash (/) is for the high issue involvement model; each coefficient to the right of the slash (/) is for the low issue involvement model.
* p < .05
**p < .01
***p < .001

Although several paths are statistically significant, the multi-group method of testing different models revealed that one (of six) pair of path coefficients was significantly different. The path between perceived threat-to-choice and reactance was significantly greater for participants with high issue involvement (β = .45) compared to those with low issue involvement (β = .18), (z = 2.55, p < .05). No other differences emerged.

CHAPTER IV

DISCUSSION

The present dissertation set out to (a) understand how reactance was conceptualized as a motivational state, (b) determine whether threat-to-choice, vivid, and explicit language (along with an additive effect of the aforementioned message features) would trigger reactance, (c) empirically measure how reactance is restored directly and/or indirectly, and (d) investigate the role of issue involvement on message processing of reactance-inducing messages advocating exercise and sunscreen usage. The findings from this study are elaborated on below with attention given to how these results compare with previous work conducted within a PRT framework. In addition, directions for future work along with limitations to this study are discussed.

Reactance Conceptualization

From the outset, the advantages of designing health messages based on theory were promulgated. Although theory performs a pivotal role in the construction of several health campaigns, the incorporation of PRT recently emerged as a noteworthy theory to consider when crafting messages targeted at individuals, particularly adolescents and young adults (Brehm & Brehm, 1981; Burgoon, Alvaro, Grandpre et al., 2002; Grandpre et al., 2003). In light of the infancy of PRT within the health context, several questions surrounding this theory and how it impacts message design exist.

For starters, the operationalization of reactance as a motivational state remains challenged (Brehm, 1966; Brehm & Brehm, 1981; Dillard & Shen, 2004; Stephenson & Quick, 2004). As a result, most researchers treat reactance as a trait rather than a

motivational state (Hong & Faedda, 1996; Hong & Page, 1989; Hong, 1992; Merz, 1983). In fact, only recently have communication researchers begun to operationalize reactance as a state (Dillard & Shen, 2004; Stephenson & Quick, 2004). This work yields inconsistent findings surrounding the nature of reactance as a motivational state. Initially, Dillard and Shen (2004) argued that reactance is comprised of unfavorable thoughts and state anger whereas Stephenson and Quick (2004) were unable to get these elements to load as a latent factor.

The findings from this dissertation suggest that reactance is comprised of both unfavorable cognitions and state anger. In short, all six structural models suggest that unfavorable cognitions and anger do load as a latent factor, providing support for Dillard and Shen's (2004) work. Perhaps Stephenson and Quick (2004) were unable to replicate this finding due to their modest sample size ($N = 160$) and repeated measures design of 7 messages. Fatigue and sheer frustration might have hindered the reporting accuracy by participants. In short, the findings from this study bolster the notion of conceptualizing and operationalizing reactance as being comprised of unfavorable cognitions and state anger.

However, methodological issues exist regarding the operationalization of unfavorable cognitions. Dillard and Shen (2004) used trained coders to code participant's thoughts as supportive, neutral, or negative. Furthermore, they only included relevant negative cognitions in their analysis. Stephenson and Quick (2004) did not employ trained coders but rather had participants indicate whether their thoughts were favorable, neutral, or unfavorable. Unfavorable cognitions represented the number

of unfavorable thoughts divided by the total number of thoughts. For this investigation, participants identified whether their thoughts were favorable, neutral, or unfavorable and the sum of unfavorable cognitions was used in the analyses. Although recent evidence suggests measuring reactance via negative cognitions and state anger, the question remains how to measure unfavorable cognitions most effectively. Future research should address this methodological issue by running competing models.

Message Features Eliciting Reactance

As communication researchers our primary focus *should* be on which message features bring about certain effects? Despite little disagreement surrounding the primary objective of communication scholarship and an inherent belief about what we, as scholars, contribute to the academic community as a whole, few communication researchers actually test the effects of specific message features on outcome variables of interest (O'Keefe, 2003). Put more bluntly, O'Keefe (2003) states that a problem with our scholarship is "a deeper inattention to the intrinsic features of message variations" (p. 269). O'Keefe (2003) goes on to argue that by inadequately assessing the relationship between message properties and effects, "message designers will have little guidance about the construction of effective messages, and theoretical understandings of persuasion will inevitably be stunted." (p. 269) Due to the inadequate attention given to message features, researchers interested in PRT have encouraged research to identify which specific message features elicit reactance (Burgoon, Alvaro, Grandpre et al., 2002; Dillard & Shen, 2004; Stephenson & Quick, 2004). In response to this charge, the present dissertation examined the effects of threat-to-choice, vivid, and explicit language

on reactance. In addition, the outcomes following exposure to a message containing all three message features is discussed below.

Threat-to-Choice Language

Following the tenets of Brehm's (1966) PRT it was predicted that high threat-to-choice language would elicit significantly more reactance than low threat-to-choice language. According to Brehm, any message perceived as a threat to one's freedom will galvanize reactance. Threat-to-choice language was conceptualized here as any message that uses threatening, pressuring, and opinionated language designed to force readers into compliance (Burgoon, Alvaro, Broneck, et al. 2002; Dillard & Shen, 2004; Grandpre et al., 2003; Quick & Stephenson, 2004). For both exercise and sunscreen, messages containing high-threat-to-choice language elicited significantly greater reactance than that containing low-threat-to-choice language. This finding provides empirical support for hypothesis number one and resonates with existing PRT research (Burgoon, Alvaro, Broneck, et al. 2002; Dillard & Shen, 2004; Stephenson & Quick, 2004). Additionally, hypothesis two found that perceived high threat-to-choice language elicited significantly more reactance than perceived low threat-to-choice language. These findings extend the theoretical assumptions of PRT as well as offer practical advice for health practitioners.

Theoretically speaking, the verification that high threat-to-choice language elicits reactance is a valuable contribution to the field. Previous research documents the undesirable effects following exposure to reactance-inducing messages (see Brehm, 1993; Burgoon, Alvaro, Grandpre, & Voloudakis, 2002). However, this research line

provides little guidance as to what specific message features elicit reactance. Only recently has this hole in the literature been called into question (Dillard & Shen, 2004; O'Keefe, 2003; Stephenson & Quick, 2004). In attempts to address this gap, the findings from this study unequivocally demonstrate high threat-to-choice language is in fact a reactance-inducing message feature.

The results from hypotheses one and two provide health campaigners with practical guidelines regarding message construction. Mainly, to increase the probability of effective health messages, practitioners should avoid using high threat-to-choice language. Particularly, phrases that appear dogmatic and authoritarian should be avoided (Janis & Mann, 1977; Siegel & J. Burgoon, 2002). Additionally, audiences perceiving messages to connote paternalistic preaching message should be avoided, particularly messages targeting adolescents and/or young adults (Austin, 1995; Brehm, 1966). The findings from this research and existing studies illuminate the aversive outcomes associated with using high threat-to-choice language in health messages (see Burgoon, Alvaro, Broneck, et al. 2002; Burgoon, Alvaro, Grandpre, & Voloudakis, 2002; Dillard & Shen, 2004; Grandpre et al., 2002; Stephenson & Quick, 2004).

Vivid Language

Vivid language describing the consequences of not exercising and not using sunscreen was the second message feature predicted to elicit reactance. Specifically, vivid language was conceptualized as concrete and imagery-provoking phrases describing the consequences of not performing certain behaviors (Keller & Brock, 1997;

Nisbett & Ross, 1980). The rationale behind vivid language as a precursor to reactance was because vivid language is believed to make arguments more transparent.

With that said, messages containing vivid language did elicit significantly more reactance than messages using non-vivid language to describe consequences. Although messages containing vivid language elicited greater reactance than those featuring non-vivid language within both contexts, individual perceptions of language vividness were not positively associated with reactance. In fact, for the sunscreen messages, perceptions of vivid language were negatively associated with reactance, suggesting that non-vivid language is linked to unfavorable cognitions and reduced anger. This finding is intriguing provided that messages containing vivid language did elicit significantly greater reactance than messages containing non-vivid language. Despite the graphic descriptions of the consequences, it is plausible that the content was perceived as unrealistic and consequently processed peripherally (Petty & Cacioppo, 1986).

The distinction between actual message features and perceived message features is of interest. The sensation seeking literature suggests message features and perceived message features are different variables (Morgan, Palmgreen, Stephenson, Hoyle, & Lorch, 2003). These researchers discovered that subjective reactions to a message are distinct from the actual objective content features eliciting these reactions (Stephenson & Palmgreen, 2001). This appears to be the case in the present study, particularly regarding vivid language. In short, although hypothesis four did not achieve statistical significance, hypothesis three demonstrated that vivid language elicits more reactance than non-vivid language. The results from hypothesis three and four raise interesting

questions regarding the relationship between vivid language and reactance. These findings are valuable for PRT and beneficial for health practitioners alike.

Brehm (1966) asserts that anything perceived as a threat will result in a motivation to restore the threatened freedom. Messages containing vivid language did elicit reactance, suggesting that vivid language is a viable threat to choice. Within the context of exercise and sunscreen usage, messages containing vivid language triggered greater reactance than messages featuring non-vivid language. However, perceived language vividness was negatively associated with reactance within the sunscreen messages. One explanation for this finding rests in the overall evaluation of vivid language within the health contexts. Prior to exposure of either message, participants indicated whether or not vivid messages were good when promoting healthy behaviors. On a -2 to 2 scale, participants indicated that practitioners using vivid language is good (M = .93, SD = .99). In essence, participants within this study did not perceive vivid language to be a negative strategy. Nevertheless, despite perceiving vivid language to be an effective strategy, participants experienced greater reactance following exposure to vivid language.

From a practical standpoint, health practitioners should proceed with caution when using vivid language. Although this finding cannot be generalized considering the messages were treated as fixed factors, the results from this investigation provide evidence admonishing the incorporation of vivid language in exercise and sunscreen messages. In sum, health practitioners should precede with caution before creating health messages containing vivid language.

Explicit Language

The final message feature examined within this investigation was explicit language. Explicit language was conceptualized as recommendations put forth in a straightforward manner (Nystrand & Wiemelt, 1991; O'Keefe, 1998; Ross & Rossner, 1989). Incorporating explicit language to deter marijuana usage has been found to elicit reactance in adolescents thus providing justification for an expected positive association between explicit language and reactance (Grandpre et al., 2003). In their study, explicit language was operationalized as the persuasive intent of the message. Results from the current study revealed no difference in reactance arousal between participants presented with explicit and implicit language within the context of exercise or sunscreen usage. Although specific recommendations were explicitly stated, perhaps the persuasive intent of the message was not conveyed, thus failing to ignite reactance. Structural equation modeling presented a slightly different representation between perceived explicit language and reactance. For the exercise message, the association between perceived explicit language and reactance was significant, albeit in the negative direction. This finding was not replicated for the sunscreen message, as the relationship between explicit language and reactance was nonsignificant. Of the three message features examined in this investigation, this finding is the most difficult to interpret from a theoretical standpoint.

PRT clearly states that perceived threats will elicit reactance (Brehm, 1961; Brehm, 1993; Brehm & Brehm, 1981). In this study, specific recommendations were implemented to identify how much [exercise to do and sunscreen to use when exposed to

the sun.] Explicitly stating recommendations was intended to elicit reactance as opposed to messages encouraging participants to determine appropriate amounts for themselves. This prediction was unfounded. Results indicate that perceived explicit language reduced reactance for the exercise message but had no effect in the sunscreen message. This finding appears to contradict PRT.

However, participants may not have perceived the explicit recommendation to threaten their freedom. This explanation is plausible given that participants valued exercise. Prior to the experiment, on a 1 to 7 scale, participants indicated that exercise was a priority ($M = 5.56$, $SD = 1.28$). According to PRT, the magnitude of reactance aroused is largely dependent on the perceived attractiveness of the threatened or eliminated freedom (Brehm & Brehm, 1981). In essence, this finding suggests there might be a loophole in PRT. That is, if a topic is important to an audience, then explicit recommendations in favor of their position will not lead to reactance. This situation is likened to preaching to the choir!

From a practical standpoint, this finding is refreshing. As health campaigners it is our ethical responsibility to clearly state the necessary course of action required to deter unhealthy outcomes. By explicitly stating recommendations, we run the risk of being perceived as paternalistic. After all, we have a duty to educate the public about healthy lifestyles. In sum, the results from this investigation suggest that explicit language is not positively associated with reactance; therefore, health campaigners should continue to incorporate explicit language into health messages.

In sum, of the three message features examined within this investigation, threat-to-choice language elicited the most reactance. Vivid language triggered reactance to a lesser degree whereas explicit language actually reduced reactance. These findings provide partial support for the RPM. The decision to model individual perceptions of message features rather than actual content features was arbitrary. Modeling the actual message features as opposed to perceived message features may have yielded more support for the RPM. Specifically, Pearson zero-order correlations revealed that reactance was positively associated with high threat-to-choice ($r = .37$, $p < .01$) and vivid ($r = .11$, $p < .01$) language for the exercise messages. These associations were replicated for the sunscreen messages as positive associations existed between reactance and high threat-to-choice ($r = .37$, $p < .01$) and vivid language ($r = .12$, $p < .01$). However, Person zero-order correlations suggest no association between reactance and explicit language for either the exercise ($r = .02$, $p = .67$) or sunscreen ($r = -.02$, $p = .58$) messages. In sum, the RPM would likely receive more support treating message features as objective realities rather than subjective perceptions of message features.

Additive Effect of Threat-to-Choice, Vivid, and Explicit Language

Messages with all three message features were expected to trigger more reactance than messages containing fewer message features. This prediction was not completely supported. Messages containing high threat-to-choice language elicited more reactance than messages featuring low-threat-to-choice language for both contexts. Exercise messages containing high threat-to-choice, implicit, and vivid language generated greater reactance than messages containing high threat-to-choice, implicit, and

non-vivid language. Sunscreen messages containing high threat-to-choice and vivid language elicited more reactance than messages containing high threat-to-choice and non-vivid language. The presence of explicit language had no additional effect on reactance. Clearly, high threat-to-choice language is driving reactance arousal in these message conditions. The combination of high threat-to-choice and vivid language appears to slightly heighten reactance arousal. This finding came as no surprise as significant main effects were found for both threat-to-choice and vivid language within the analyses. This finding presents both theoretical and practical implications.

Theoretically speaking, evidence for an additive effect resonates with PRT. Principle 3 states that as threats increase, the magnitude of reactance arousal increases as well (Brehm, 1966; Brehm, 1993; Brehm & Brehm, 1981). However, results from this experiment do not universally support an additive effect across the board. Rather, the results indicate the combination of high threat-to-choice and vivid language enhances reactance arousal. Perhaps the vivid descriptions magnified the high threat-to-choice language, thus making the threat more apparent. Replication of this finding within a different context or medium will provide more generalizable evidence for an additive effect.

From a practical standpoint, clearly the message feature to avoid using is high-threat-to-choice language (Dillard & Shen, 2004; Stephenson & Quick, 2004). With that said, practitioners incorporating vivid language must be careful to *not* use high threat-to-choice language perceived as condescending, dogmatic, forceful, paternalistic, or authoritarian. I am not recommending for health practitioners to stray away from using

vivid descriptions because they are useful in certain situations (Stephenson & Witte, 2001; Witte, 1992). However, the combination of high threat-to-choice and vivid language appears to arouse the most reactance in college students.

Reactance Restoration

The current measurement of outcomes associated with reactance is inconsistent. Previous PRT research examines the outcomes associated with reactance by assessing attitudes (Dillard & Shen, 2004; Grandpre et al., 2003; Rains & Mitchell-Turner, 2004; Stephenson & Quick, 2004), behavioral intentions (Bensley & Wu, 1991; Burgoon, Alvaro, Broneck et al., 2002; Dillard & Shen, 2004; Grandpre et al., 2003), message evaluation (Grandpre et al., 2003), and source evaluation (Burgoon, Alvaro, Broneck et al., 2002). Although the reliance of these variables results in reliable measures, the validity of these instruments is questionable because they do not assess reactance restoration, per se, but the outcomes resulting from reactance restoration.

Brehm (1966) conceptualized reactance as a motivational state. Therefore, PRT states that individuals experiencing this aversive state are motivated to regain or restore their threatened freedom for a short time afterwards. According to Brehm and Brehm (1981), following exposure to a reactance-inducing stimuli or object, individuals will restore their threatened or eliminated freedom either directly or indirectly. A strong desire to restore a threatened freedom is particularly enticing when the threat is attractive (Brehm & Brehm, 1981). More specifically, threats are attractive when they are related to an individual's values, beliefs, attitudes, and behaviors (see Pennebaker et al., 1979). Until the recent advancement of the Reactance Restoration Scale (RRS), no measure

existed to assess the relationship between reactance and both direct and indirect restoration. In fact, past and current PRT research is concerned solely with direct restoration in the form of a boomerang effect. Below, the relationship between reactance and (a) "Boomerang," (b) "Related Boomerang," and (c) "Vicarious Boomerang" are discussed in detail.

In general, the present investigation found a positive relationship between reactance and "Boomerang." This type of direct restoration occurs whenever people exercise a threatened freedom by expressing their independence (a) behaviorally, (b) cognitively, or (c) emotionally in a manner opposite the threat (Brehm, 1993). This positive association between "Boomerang" and reactance was quite strong, replicated for both exercise and sunscreen contexts, and motivated individuals to do just the opposite. This finding is consistent with other PRT research (Bensley & Wu, 1991; Engs & Hanson, 1989; Grandpre et al., 2003).

Additionally, a positive association emerged between reactance and "Related Boomerang." According to Brehm and Brehm (1981), rather than perform the admonished behavior, individuals may instead choose to exercise a related freedom. The present investigation provided partial support for this prediction. This prediction was true within the context of exercise, but not for sunscreen. Perhaps this finding was not replicated due to the relative unimportance attributed to sunscreen usage by the participants within the sample ($M = 4.03$, $SD = 1.78$) when compared to exercise ($M = 5.56$, $SD = 1.28$). Prior to the activation of "Related Boomerang," participants must perceive the threat to be attractive.

The findings for "Vicarious Boomerang" mirror those of "Related Boomerang." "Vicarious Boomerang" occurs when a person restores his or her threatened freedom by vicariously observing others engage in the threatened freedom (Brehm, 1993; Brehm & Brehm, 1981). For the exercise messages, a positive association between reactance and "Vicarious Boomerang" existed whereas this relationship was not significant for sunscreen messages. Participants perceived sunscreen usage to be unimportant. Therefore perhaps the threat was unattractive and subsequently did not elicit enough reactance to galvanize "Vicarious Restoration."

In sum, "Boomerang," "Related Boomerang," and "Vicarious Boomerang," provide a unique dimension of reactance restoration. When examining the three types of reactance restoration overall it appears that "Boomerang" is activated regardless of threat importance. To the contrary, "Related Boomerang" and "Vicarious Boomerang" require an attractive threat before being set into motion. This finding was evident in this investigation. Participants indicated high exercise ($M = 5.56$, $SD = 1.28$) and moderate sunscreen ($M = 4.03$, $SD = 1.78$) issue involvement. For the exercise messages, reactance was positively associated with all three restoration types whereas only "Boomerang" restoration was positively associated with reactance for the sunscreen messages.

Issue Involvement

Another important area addressed in this study was the role of issue involvement in the RPM. We know from both dual-processing models that issue involvement is positively associated with central or systematic processing (Chaiken, 1980; Petty &

Cacioppo, 1986). Given the research supporting both models, the assumption is that as issue involvement increases, message scrutiny increases. This belief coupled with the second principle of PRT, which states that as the importance of a threatened freedom increases, reactance arousal increases, provided the rationale behind hypothesis 11 (Brehm, 1966; Brehm & Brehm, 1981). It was hypothesized that issue involvement would moderate the relationship between reactance-inducing message features, reactance, and reactance restoration. More specifically, a stronger positive association between message features, reactance, and reactance restoration was expected for participants with high issue involvement compared to those with low issue involvement.

Results indicated only one subtle difference occurring between participants with high and low issue involvement within the two message contexts. The lone difference that emerged was between perceived threat-to-choice language and reactance within the context of sunscreen usage. Threat-to-choice language had a significantly stronger effect on reactance under high issue involvement conditions. This difference provides some empirical support of Brehm's (1966) second principle, which states a positive association between the importance of the threatened freedom and the magnitude of reactance arousal (Brehm & Brehm, 1981). However, this finding should be interpreted with caution because it was not reproduced with the exercise messages. This was not surprising given the median split for issue involvement related to exercise, discussed later in this section. No other differences emerged between the three message features and reactance for participants with high and low issue involvement. Along these lines,

no differences emerged between participants with high and low issue involvement for reactance and reactance restoration for the exercise or sunscreen messages.

In sum, differences between high- and low- issue involved participants were minimal at best. Perhaps one explanation for this null finding rests in the sample under study. Particularly, individuals indicated that exercise was a priority to them and was very important. The consequences resulting from this misrepresentation of diversity led to a skewed sample. In fact, on a 1 to 7 scale, the average for issue involvement pertaining to exercise was quite high ($M = 5.56$, $SD = 1.28$). Therefore, the median split for this population was skewed (low issue involvement (1 to 5.6), high issue involvement (5.8 to 7)). Skewness was not problematic for sunscreen usage. For the sunscreen messages, a significant difference within the RPM was detected in the hypothesized direction. In essence, the lack of issue involvement variation issue involvement hindered the analysis of this last hypothesis.

RPM

From the outset, the RPM was designed to advance a framework for theorists and health practitioners alike to explain the role that reactance plays. Specifically, this investigation set out to (a) identify message features triggering reactance, (b) accurately conceptualize reactance, and (c) examine the outcomes associated with reactance. Overall, the RPM proved to be a useful model for identifying the three aforementioned issues. Each of the three components is summarized in turn below.

Message Features

First, the model provides empirical support for a positive association between high threat-to-choice language and reactance. However, perceived vivid and explicit language was significant in the opposite direction for the exercise messages and negligible for the sunscreen messages. However, replacing perceived message features with actual objective message features might demonstrate statistical support for the RPM. Hence, future research must address these inconsistencies between perceptions of message features and objective content on reactance in different contexts using different channels. Along these lines, examination into other message features arousing reactance should be examined such as visual images and argument quantity.

Reactance Conceptualization

Second, support for treating reactance as a latent variable comprised of unfavorable cognitions and anger was significant for both exercise and sunscreen contexts. With that said, the measurement issue surrounding unfavorable cognitions raised earlier requires further attention. Future research should run competing models to test which operationalization of unfavorable cognitions offers the best representation of reactance.

Reactance Restoration

Finally, the RPM demonstrates three outcomes associated with reactance arousal. Specifically, participants experiencing reactance, within the contexts of exercise and sunscreen, were motivated to restore their threatened freedom via "Boomerang." That is, participants were motivated to *not* exercise and *not* use sunscreen following exposure

to reactance-inducing print messages. Partial support for "Related Boomerang" and "Vicarious Boomerang" was also found within this investigation. Specifically, reactance inducing exercise print messages aroused participants to desire performing unhealthy behaviors and to observe others engage in the threat. To the contrary, where issue involvement was low, reactance-inducing sunscreen print messages did not arouse "Related Boomerang" and "Vicarious Boomerang." In essence, all three forms of reactance restoration appear to be viable alternatives following exposure to a threat. This finding resonates with Brehm and Brehm's (1981) prediction.

Limitations and Future Research

There are inherent limitations within the present investigation. First, the artificial nature of the experiment hinders the generalizability of the conclusions. Although the external validity is limited, the tradeoff is an internally valid study (Babbie, 2002; Campbell & Stanley, 1963; Cook & Campbell, 1979). Along these lines, experimental designs are not ideally suited for the cumulative effect that these print messages would have if displayed during a typical occurrence, such as thumbing through a magazine or looking at a poster. Nonetheless, the benefits of conducting an experiment of this magnitude afforded the comparison of two topics within a controlled environment resulting in a clean experiment. By comparing two topics, a more comprehensive picture of the RPM emerged. Future research should assess the RPM within different contexts. For example, the RPM would provide a nice framework for advertisers and politicians alike in understanding why a certain advertisement did not garner the intended results.

Second, using college students as participants limits the generalizability of the results. However, the topics selected for this investigation, exercise and sunscreen usage, are as salient to college students as other populations, therefore constitute a suitable sample. According to PRT, within the typical lifespan reactance arousal is maximized for adolescents (Brehm, 1993). With that said, researchers interested in testing PRT principles along with the RPM are advised to conduct such inquiries with junior and senior high school students. Additionally, future research should test the RPM with young children, young adults, middle-aged adults, and senior citizens alike. The potential differences in reactance arousal arising between these segmented populations would extend the theoretical scope of PRT.

Along these lines, future research should test PRT principles as well as the RPM across different cultures. Existing PRT research draws from predominantly western cultures where individualism is valued (Beebe & Masterson, 2003; Samovar & Porter, 2004). This was the case in the present investigation. An underlying assumption of PRT is that individual's place a premium on autonomy (Brehm, 1966; 1993). Provided this assumption, the tenets of PRT may *not* uphold in collectivist cultures where the emphasis is on the group, not the individual (Bantz, 1993).

Another limitation with the present study rests in the medium used to present the messages. The advantage of using print stimuli is the ease in message manipulation. Given the focus of this investigation was to manipulate the effects of three specific message features on reactance, print messages allowed for a more precise manipulation compared to other visual mediums. Previous research examines reactance following

exposure to health message communicated via the computer (Burgoon, Alvaro, Broneck et al., 2002; Grandpre et al., 2003), television (Stephenson & Quick, 2004), and print channels (Dillard & Shen, 2004). Future research should test the RPM using a variety of channels. The ability for the RPM to replicate across a variety of channels would enhance the model's generalizability but also extend the heuristic value of PRT.

Finally, although the benefits of employing a mass mediated campaign is well documented within the literature (see Atkin, 2001) few studies measure the impact of interpersonal communication on a campaigns success (Hornik, 2002; Valente & Saba, 1998). Campaigners argue that interpersonal communication offers several perks (Atkin, 2001; Brown & Einsiedel, 1990; Rogers & Storey, 1987; Wartella & Stout, 2002). Given the significant role of interpersonal channels within health campaigns, future research should investigate how individuals communicate about reactance eliciting messages compared to non-reactance eliciting messages. How a message diffuses within a population via face-to-face communication is well documented (Rogers, 2003) and has received attention among health campaign scholars (Dearing et al., 1996). However, this research does not measure the actual face-to-face communication occurring. With that said, face-to-face communication should emerge as an outcome variable of interest when evaluating a campaign (Hornik, 2002).

CHAPTER V

CONCLUSION

The present investigation advances our understanding of PRT in five ways. First, findings in both contexts provided empirical support for operationalizing reactance as a latent construct comprised of unfavorable cognitions and state anger. Second, of the three message features examined, high threat-to-choice and vivid language, along with a combination of both, were found to elicit reactance whereas explicit language did not trigger reactance. Third, perceived high threat-to-choice language was positively associated with reactance whereas perceived vivid and explicit language was either negatively or not associated with reactance. Fourth, evidence suggests that reactance is positively related to three types of restoration including "Boomerang," "Related Boomerang," and "Vicarious Boomerang." "Boomerang" appears to be set into motion regardless of threat attractiveness whereas the latter two require an attractive threat before being triggered.

Establishing the RRS enables researches a reliable and valid instrument to incorporate within studies using PRT as a theoretical guide as well as studies utilizing other behavior change theories. For instance, theorists employing the Activation Model of Information Exposure, Diffusion Theory, the EPPM, Social Marketing Theory, Social Learning Theory, and the Theory of Reasoned Action could benefit from this instrument. Also, Transtheoretical Model researchers may find the RRS to be useful in assessing the different motivation levels individual's progress through the five stages of change. In general, theorists and researchers investigating the persuasiveness messages will find the

RRS to be an instrumental measure in theory building as well as an applicable and precise instrument to employ when testing theory.

Overall, the RPM provides health practitioners and academics with a theoretical framework that explains why certain messages are successful while others are unsuccessful in promoting behavior change. Unsuccessful health campaigns are discouraging given the amount of money invested to encourage participation in healthy behaviors. Whereas several campaigns are grounded in theory, the RPM offers practical suggestions for message construction. The take-home message from this investigation is this, if you want to effectively persuade your target audience to perform certain behaviors then frame your message in a manner that emphasizes individual choice among a cluster of desirable alternatives.

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APPENDIX A

PRETEST PRINT MESSAGES

Print Message #1

(High-threat-to-choice language, Explicit recommendation, Vivid consequences)

You simply cannot deny all the evidence showing that drinking too much alcohol leads to Aggies flunking out of school, experiencing date rape, or even death. Drinking responsibly means no more than 5 drinks on one occasion if you are a man and no more than 4 if you are a woman. If you are at all reasonable, you will agree that the over-consumption of alcohol is a serious campus problem at Texas A & M University that demands immediate attention from you. You must stop the denial. There is a problem and you must be a part of the solution. So if you drink, you better drink responsibly. Five or less drinks on one occasion for men and 4 or less for women are a safe, reasonable, and a responsible limit and it's the limit that you must stick to. You simply have to do it. After all, you definitely do not want to flunk out of school, experience date rape, or even death do you? As you can see, the choice is crystal clear: men must drink less than 5 drinks on one occasion and women must drink less than 4 every time!

Print Message #2

(High-threat-to-choice language, Implicit recommendation, Vivid consequences)

You simply cannot deny all the evidence showing that drinking too much alcohol leads to Aggies flunking out of school, experiencing date rape, or even death. Drinking responsibly means that you must know your own limits when it comes to how much alcohol you are going to consume on any one occasion. If you are at all reasonable, you will agree that the over-consumption of alcohol is a serious campus problem at Texas A & M that demands immediate attention from you. You must stop the denial. There is a problem and you must be a part of the solution. So if you drink, you have no other choice but to drink responsibly. Understanding your own alcohol limits is safe, reasonable, and a responsible limit and it is a limit you must stick to. You simply have to do it. After all, you definitely do not want to flunk out of school, experience date rape, or even death do you? As you can see, the choice is crystal clear: if you drink, you must set your own limits and drink responsibly every time!

Print Message #3

(High-threat-to-choice language, Explicit recommendation, Non-vivid consequences)

You simply cannot deny all the evidence that drinking too much alcohol leads to Aggies reduced academic performance, regretful sexual experiences, and harm to others including the drinker. Drinking responsibly means no more than 5 drinks on one occasion if you are a man and no more than 4 if you are a woman. If you are at all reasonable, you will agree that the over-consumption of alcohol is a serious campus problem at Texas A & M that demands immediate attention from you. You must stop the denial. There is a problem and you must be a part of the solution. So if you drink, you better drink responsibly. Five or less drinks on one occasion for men and 4 or less for women are a safe, reasonable, and a responsible limit and it's the limit that you must to stick to. You simply have to do it. After all, you definitely do not want to experience reduced academic performance, regretful sexual experiences, and harm to others including yourself, do you? As you can see, the choice is crystal clear: men must drink less than 5 drinks on one occasion and women must drink less than 4 every time!

Print Message #4

(High-threat-to-choice language, Implicit recommendation, Non-vivid consequences)

You simply cannot deny all the evidence showing that drinking too much alcohol leads Aggies to a decline in academic performance, regretful sexual experiences, and harm to others including the drinker. Drinking responsibly means you must know your own limits when it comes to how much alcohol you are going to consume. If you are at all reasonable, you will agree that the over-consumption of alcohol is a serious campus problem at Texas A & M that demands immediate attention from you. You must stop the denial. There is a problem and you must be a part of the solution. So if you drink, you better drink responsibly. Understanding your own alcohol limits is safe, reasonable, and a responsible limit and it is a limit you must stick to. You simply have to do it. After all, you definitely do not want to experience reduced academic performance, regretful sexual experiences, and harm to others including yourself, do you? As you can see, the choice is crystal clear: if you drink, you must set your own limits and drink responsibly every time!

Print Message #5

(Low-threat-to-choice language, Implicit recommendation, Non-vivid consequences)

There is pretty good evidence that drinking too much alcohol can lead Aggies to a decline in academic performance, regretful sexual experiences, and harm to others including the drinker. Drinking responsibly is about knowing your own limits when it comes to how much alcohol you are going to consume. Most people would agree that the over-consumption of alcohol is an important campus problem at Texas A & M that needs to be addressed. It's a sensible conclusion. You have a chance to be a part of the solution to this problem if you choose. So if you drink, why not consider drinking responsibly? Understanding your own alcohol limits appears to be a safe, reasonable, and responsible limit and it is probably a limit that you can live with. Why not give responsible drinking a try? After all, do you want to experience reduced academic performance, regretful sexual experiences, and harm to others including yourself? As you can see, we will leave the choice up to you: the choice is yours to set your own limits and drink responsibly the next time you drink.

Print Message #6

(Low-threat-to-choice language, Explicit recommendation, Non-vivid consequences)

There is pretty good evidence that drinking too much alcohol can lead Aggies to a decline in academic performance, regretful sexual experiences, and harm to others including the drinker. Drinking responsibly means fewer than 5 drinks for men and fewer than 4 for women on one occassion. Most people would agree that the over-consumption of alcohol is an important campus problem at Texas A & M that needs to be addressed. It's a sensible conclusion. You have a chance to be a part of the solution to this problem if you choose. So if you drink, why not consider limiting your alcohol consumption to less than 5 drinks if you are a man and 4 if you are a woman? This limit is reasonable and it is probably a limit you can live with. Why not consider responsible drinking? After all, do you want to experience reduced academic performance, regretful sexual experiences, and harm to others including yourself? As you can see, we will leave the choice up to you: the choice is yours to drink less than 5 drinks on one occasion if you are a man and 4 or less if you are a woman the next time you drink.

Print Message #7

(Low-threat-to-choice language, Implicit recommendation, Vivid consequences)

There is pretty good evidence that drinking too much alcohol can lead to Aggies flunking out of school, experiencing date rape, or even death. Drinking responsibly is about knowing your own limits when it comes to how much alcohol you are going to consume. Most people would agree that the over-consumption of alcohol is an important campus problem at Texas A & M that needs to be addressed. It is a sensible conclusion. You have a chance to be a part of the solution to this problem if you choose. So if you drink, why not consider drinking responsibly the next time you drink? Understanding your own alcohol limits appears to be a safe, reasonable, and responsible limit and it is probably a limit that you can live with. So why not give responsible drinking a try? After all, do you want to flunk out of school, experience date rape, or even death? As you can see, we will leave the choice up to you: the choice is yours to set your own limits and drink responsibly the next time you drink.

Print Message #8

(Low-threat-to-choice language, Explicit recommendation, Vivid consequences)

There is pretty good evidence that drinking too much alcohol can lead to Aggies flunking out of school, experiencing date rape, or even death. Drinking responsibly means having no more than 5 drinks on one occasion if you are a man and no more than 4 if you are a woman. In fact, most people agree that the over-consumption of alcohol is an important campus problem at Texas A & M that needs to be addressed. It's a sensible conclusion. You have a chance to be a part of the solution to this problem if you choose. So if you drink, why not consider limiting your alcohol consumption to less than 5 drinks if you are a man and 4 if you are a woman? This limit is reasonable and it is probably a limit you can live with. Why not give responsible drinking a try? After all, do you want to flunk out of school, experience date rape, or even death? As you can see, we leave the choice up to you: the choice is yours to drink less than 5 drinks on one occasion if you are a man and 4 or less if you are a woman the next time you drink.

Print Message #9

(High threat-to-choice, Explicit recommendation, and Vivid consequences)

You simply cannot deny all the evidence showing that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. Just look around you to see all the stressed out, overweight Aggies on this campus. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must exercise 5 days a week for 30 minutes a day of moderate intensity to significantly improve your health. You must stop the denial. There is a problem and you must be a part of the solution. If you are not exercising, you must start right now. You simply have to do it. After all, you definitely do not want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, the choice is crystal clear: you simply must exercise 5 days a week for 30 minutes a day of moderate intensity in order for you to live a much healthier life!

Print Message #10

(High threat-to-choice, Implicit recommendation, and Vivid consequences)

You simply cannot deny all the evidence showing that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. Just look around you to see all the stressed out, overweight Aggies on campus. If you are at all reasonable, you will agree that these are serious issues for students at Texas A &M. They demand your immediate attention. You must participate in a weekly exercise routine in order to significantly improve your health. You must stop the denial. There is a problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, the choice is crystal clear: you simply must participate in a weekly exercising routine in order for you to live a much healthier life!

Print Message #11

(High threat-to-choice, Explicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence showing that exercise leads to improvements in your cardiovascular, respiratory, and mental health. Just look around you to see all of the Aggies who are facing the consequences of not exercising. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must exercise 5 days a week for 30 minutes a day of moderate intensity in order to significantly improve your health. You must stop the denial. There is a considerable problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to suffer from cardiovascular, respiratory, and mental health complications do you? As you can see, the choice is crystal clear: you simply must exercise 5 days a week for 30 minutes a day of moderate intensity in order for you to live a much healthier life!

Print Message #12

(High threat-to-choice, Implicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence showing that exercise leads to improvements in your cardiovascular, respiratory, and mental health. Just look around you to see all of the Aggies who are facing the consequences of not exercising. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must participate in a weekly exercise routine in order to significantly improve your health. You must stop the denial. There is a considerable problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to suffer from cardiovascular, respiratory, and mental health complications do you? As you can see, the choice is crystal clear: you simply must participate in a weekly exercising routine in order for you to live a much healthier life!

Print Message #13

(Low threat-to-choice, Implicit recommendation, and Non-vivid consequences)

There is pretty good evidence that exercise leads to improvements in your cardiovascular, respiratory, and mental health. In fact, there is evidence right here on this campus of the consequences associated with not participating in a weekly exercise routine. Most people would agree that these issues are a fairly considerable campus problem at Texas A &M that needs to be addressed soon. By participating in a weekly exercise routine you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in a weekly exercise program, why not consider it? After all, do you want to suffer from cardiovascular, respiratory, and mental health complications? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life.

Print Message #14

(Low threat-to-choice, Explicit recommendation, and Non-vivid consequences)

There is pretty good evidence that exercise leads to improvements in your cardiovascular, respiratory, and mental health. In fact, there is evidence right here on this campus of the consequences associated with not participating in a weekly exercise routine. Most people would agree that these issues are a fairly considerable campus problem at Texas A &M that needs to be addressed soon. By exercising 5 days a week for 30 minutes a day of moderate intensity you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to suffer from cardiovascular, respiratory, and mental health complications? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to exercise 5 days a week for 30 minutes a day of moderate intensity you are more likely to live a much healthier life.

Print Message #15

(Low threat-to-choice, Implicit recommendation, and Vivid consequences)

There is pretty good evidence that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Aggies. Most people would agree that these issues are a fairly serious campus problem at Texas A &M that needs to be addressed soon. By participating in a weekly exercise routine you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life.

Print Message #16

(Low threat-to-choice, Explicit recommendation, and Vivid consequences)

There is pretty good evidence that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Aggies. Most people would agree that these issues are a fairly serious campus problem at Texas A &M that needs to be addressed soon. By exercising 5 days a week for 30 minutes a day of moderate intensity you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to exercise 5 days a week for 30 minutes a day of moderate intensity you are more likely to live a much healthier life.

Print Message #17

(High threat-to-choice, Explicit recommendation, and Vivid consequences)

You simply cannot deny the evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. If you are at all reasonable, you must agree that the problems resulting from Aggies not wearing a sunscreen with a SPF of 15 or higher is a serious problem at Texas A &M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, you must protect your skin by wearing a sunscreen with a SPF of 15 or higher. You simply have to do it. After all, you definitely do not want to experience premature wrinkling, skin blistering, and skin cancer, do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a SPF of 15 or higher every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #18

(High threat-to-choice, Implicit recommendation, and Vivid consequences)

You simply cannot deny the evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing sunscreen with a reasonable SPF level is a serious problem at Texas A & M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a reasonable SPF level. You simply have to do it. After all, you definitely do not want to experience premature wrinkling, skin blistering, and skin cancer, do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a reasonable SPF level every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #19

(High threat-to-choice, Explicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing a sunscreen with a SPF of 15 or higher is a serious problem at Texas A &M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a SPF of 15 or higher. You simply have to do it. After all, you do not want to experience skin injuries, skin diseases, and in general, declining health? As you can see, the choice is crystal clear: you must wear a sunscreen with a SPF of 15 or higher every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #20

(High threat-to-choice, Implicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Specifically, overexposure to the sun can lead to premature aging or skin cancer. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing a sunscreen with a reasonable SPF level is a serious problem at Texas A & M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a reasonable SPF level. You simply have to do it. After all, you do not want to experience skin injuries, skin diseases, and in general, declining health do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a reasonable SPF level every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #21

(Low threat-to-choice, Implicit recommendation, and Non-vivid consequences)

There is pretty good evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Most people agree that the problem resulting from Aggies not wearing sunscreen with a reasonable SPF level. This campus issue at Texas A & M needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a reasonable SPF level. Choosing to wear sunscreen with a reasonable SPF level when outside is a reasonable way to reduce the probability of dermatological injuries. After all, do you want to experience skin injuries, skin diseases, and in general, declining health? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a reasonable SPF level the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #22

(Low threat-to-choice, Explicit recommendation, and Non-vivid consequences)

There is pretty good evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Most people agree that the problem resulting from Aggies not wearing sunscreen with a SPF level of 15 or higher is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a SPF level of 15 or higher. Choosing to wear sunscreen with an SPF level of 15 or higher when outside is a reasonable way to reduce the probability of dermatological injuries. After all, do you want to experience skin injuries, skin diseases, and in general, declining health? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a SPF level of 15 or higher the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #23

(Low threat-to-choice, Implicit recommendation, and Vivid consequences)

There is pretty good evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. Most people agree that the problem resulting from Aggies not wearing sunscreen with a reasonable SPF level is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a reasonable SPF level. Choosing to wear sunscreen with a reasonable SPF level when outside is a reasonable way to reduce your risk of skin cancer. After all, do you want to experience premature wrinkling, skin blistering, and skin cancer? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a reasonable SPF level every time you are in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #24

(Low threat-to-choice, Explicit recommendation, and Vivid consequences)

There is pretty good evidence showing that sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. Most people agree that the problem resulting from Aggies not wearing sunscreen with a SPF level of 15 or higher is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are in the sun, consider protecting your skin by wearing sunscreen with a SPF level of 15 or higher. Choosing to wear sunscreen with a SPF level of 15 or higher is a reasonable way to reduce your risk of skin cancer. After all, do you want to experience premature wrinkling, skin blistering, and skin cancer? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen with a SPF level of 15 or higher: by wearing sunscreen with a SPF level of 15 or higher the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

APPENDIX B

MAIN STUDY PRINT MESSAGES

Print Message #1

(High threat-to-choice, Explicit recommendation, and Vivid consequences)

You simply cannot deny all the evidence showing that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. Just look around you to see all the stressed out, overweight Aggies on this campus. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must exercise 5 days a week for 30 minutes a day of moderate intensity to significantly improve your health. You must stop the denial. There is a problem and you must be a part of the solution. If you are not exercising, you must start right now. You simply have to do it. After all, you definitely do not want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, the choice is crystal clear: you simply must exercise 5 days a week for 30 minutes a day of moderate intensity in order for you to live a much healthier life!

Print Message #2

(High threat-to-choice, Implicit recommendation, and Vivid consequences)

You simply cannot deny all the evidence showing that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. Just look around you to see all the stressed out, overweight Aggies on campus. If you are at all reasonable, you will agree that these are serious issues for students at Texas A &M. They demand your immediate attention. You must participate in a weekly exercise routine in order to significantly improve your health. You must stop the denial. There is a problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, the choice is crystal clear: you simply must participate in a weekly exercising routine in order for you to live a much healthier life!

Print Message #3

(High threat-to-choice, Explicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence showing that exercise leads to improvements in your cardiovascular, respiratory, and mental health. Just look around you to see all of the Aggies who are facing the consequences of not exercising. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must exercise 5 days a week for 30 minutes a day of moderate intensity in order to significantly improve your health. You must stop the denial. There is a considerable problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to suffer from cardiovascular, respiratory, and mental health complications do you? As you can see, the choice is crystal clear: you simply must exercise 5 days a week for 30 minutes a day of moderate intensity in order for you to live a much healthier life!

Print Message #4

(High threat-to-choice, Implicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence showing that exercise leads to improvements in your cardiovascular, respiratory, and mental health. Just look around you to see all of the Aggies who are facing the consequences of not exercising. If you are at all reasonable, you will agree that these are serious issues for students at Texas A & M. They demand your immediate attention. You must participate in a weekly exercise routine in order to significantly improve your health. You must stop the denial. There is a considerable problem and you must be a part of the solution. So if you are not already participating in an exercise program, you must start right now. You simply have to do it. After all, you definitely do not want to suffer from cardiovascular, respiratory, and mental health complications do you? As you can see, the choice is crystal clear: you simply must participate in a weekly exercising routine in order for you to live a much healthier life!

Print Message #5

(Low threat-to-choice, Implicit recommendation, and Non-vivid consequences)

There is pretty good evidence that exercise leads to improvements in your cardiovascular, respiratory, and mental health. In fact, there is evidence right here on this campus of the consequences associated with not participating in a weekly exercise routine. Most people would agree that these issues are a fairly considerable campus problem at Texas A &M that needs to be addressed soon. By participating in a weekly exercise routine you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in a weekly exercise program, why not consider it? After all, do you want to suffer from cardiovascular, respiratory, and mental health complications? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life.

Print Message #6

(Low threat-to-choice, Explicit recommendation, and Non-vivid consequences)

There is pretty good evidence that exercise leads to improvements in your cardiovascular, respiratory, and mental health. In fact, there is evidence right here on this campus of the consequences associated with not participating in a weekly exercise routine. Most people would agree that these issues are a fairly considerable campus problem at Texas A &M that needs to be addressed soon. By exercising 5 days a week for 30 minutes a day of moderate intensity you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to suffer from cardiovascular, respiratory, and mental health complications? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to exercise 5 days a week for 30 minutes a day of moderate intensity you are more likely to live a much healthier life.

Print Message #7

(Low threat-to-choice, Implicit recommendation, and Vivid consequences)

There is pretty good evidence that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Aggies. Most people would agree that these issues are a fairly serious campus problem at Texas A &M that needs to be addressed soon. By participating in a weekly exercise routine you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to participate in a weekly exercise routine you are more likely to live a much healthier life.

Print Message #8

(Low threat-to-choice, Explicit recommendation, and Vivid consequences)

There is pretty good evidence that exercise saves you from dying of a massive heart attack, clogged arteries, morbid obesity, and being stressed out of your mind. In fact, there is evidence right here on this campus of stressed out, overweight Aggies. Most people would agree that these issues are a fairly serious campus problem at Texas A &M that needs to be addressed soon. By exercising 5 days a week for 30 minutes a day of moderate intensity you are more likely to improve your health. You have a chance to be a part of the solution to this problem if you choose. So if you are not already participating in an exercise program, why not consider it? After all, do you want to die from a massive heart attack, clogged arteries, morbid obesity, or be freaking out do you? As you can see, we will leave the conclusion up to you regarding your participation in a weekly exercise program: by choosing to exercise 5 days a week for 30 minutes a day of moderate intensity you are more likely to live a much healthier life.

Print Message #9

(High threat-to-choice, Explicit recommendation, and Vivid consequences)

You simply cannot deny the evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. If you are at all reasonable, you must agree that the problems resulting from Aggies not wearing a sunscreen with a SPF of 15 or higher is a serious problem at Texas A &M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, you must protect your skin by wearing a sunscreen with a SPF of 15 or higher. You simply have to do it. After all, you definitely do not want to experience premature wrinkling, skin blistering, and skin cancer, do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a SPF of 15 or higher every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #10

(High threat-to-choice, Implicit recommendation, and Vivid consequences)

You simply cannot deny the evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing sunscreen with a reasonable SPF level is a serious problem at Texas A & M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a reasonable SPF level. You simply have to do it. After all, you definitely do not want to experience premature wrinkling, skin blistering, and skin cancer, do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a reasonable SPF level every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #11

(High threat-to-choice, Explicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing a sunscreen with a SPF of 15 or higher is a serious problem at Texas A &M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a SPF of 15 or higher. You simply have to do it. After all, you do not want to experience skin injuries, skin diseases, and in general, declining health? As you can see, the choice is crystal clear: you must wear a sunscreen with a SPF of 15 or higher every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #12

(High threat-to-choice, Implicit recommendation, and Non-vivid consequences)

You simply cannot deny all the evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Specifically, overexposure to the sun can lead to premature aging or skin cancer. If you are a reasonable person, you have to agree that the problems resulting from Aggies not wearing a sunscreen with a reasonable SPF level is a serious problem at Texas A & M that demands your immediate attention. You must stop the denial. There is a problem and you must be a part of the solution. So if you are going to be out in the sun, protect your skin by wearing sunscreen with a reasonable SPF level. You simply have to do it. After all, you do not want to experience skin injuries, skin diseases, and in general, declining health do you? As you can see, the choice is crystal clear: you must wear a sunscreen with a reasonable SPF level every time you are in the sun in order to reduce your odds of experiencing the consequences associated with sun overexposure!

Print Message #13

(Low threat-to-choice, Implicit recommendation, and Non-vivid consequences)

There is pretty good evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Most people agree that the problem resulting from Aggies not wearing sunscreen with a reasonable SPF level. This campus issue at Texas A & M needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a reasonable SPF level. Choosing to wear sunscreen with a reasonable SPF level when outside is a reasonable way to reduce the probability of dermatological injuries. After all, do you want to experience skin injuries, skin diseases, and in general, declining health? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a reasonable SPF level the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #14

(Low threat-to-choice, Explicit recommendation, and Non-vivid consequences)

There is pretty good evidence that overexposure to the sun leads to skin injuries, skin diseases, and in general, declining health. Most people agree that the problem resulting from Aggies not wearing sunscreen with a SPF level of 15 or higher is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a SPF level of 15 or higher. Choosing to wear sunscreen with an SPF level of 15 or higher when outside is a reasonable way to reduce the probability of dermatological injuries. After all, do you want to experience skin injuries, skin diseases, and in general, declining health? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a SPF level of 15 or higher the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #15

(Low threat-to-choice, Implicit recommendation, and Vivid consequences)

There is pretty good evidence showing that overexposure to the sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. Most people agree that the problem resulting from Aggies not wearing sunscreen with a reasonable SPF level is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are going to be out in the sun, consider protecting your skin by wearing sunscreen with a reasonable SPF level. Choosing to wear sunscreen with a reasonable SPF level when outside is a reasonable way to reduce your risk of skin cancer. After all, do you want to experience premature wrinkling, skin blistering, and skin cancer? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen: by wearing sunscreen with a reasonable SPF level every time you are in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

Print Message #16

(Low threat-to-choice, Explicit recommendation, and Vivid consequences)

There is pretty good evidence showing that sun leads to premature wrinkling, severe skin blisters that ooze and become crusty, and even skin cancer. Most people agree that the problem resulting from Aggies not wearing sunscreen with a SPF level of 15 or higher is a campus problem at Texas A & M that needs to be addressed. You have a chance to be a part of the solution to this problem if you choose. So if you are in the sun, consider protecting your skin by wearing sunscreen with a SPF level of 15 or higher. Choosing to wear sunscreen with a SPF level of 15 or higher is a reasonable way to reduce your risk of skin cancer. After all, do you want to experience premature wrinkling, skin blistering, and skin cancer? As you can see, we leave the choice up to you. The choice is yours to wear sunscreen with a SPF level of 15 or higher: by wearing sunscreen with a SPF level of 15 or higher the next time you are outside in the sun you will reduce your odds of experiencing the effects associated with sun overexposure.

APPENDIX C

PRETEST AND MAIN STUDY TABLES

Table 2.1

Factor Analysis of Alcohol Print Message

Item	Factor				
	I	II	III	IV	V
(1) Nonspecific-Specific	.95	.01	.03	-.04	-.06
(2) Vague-Exact	.95	.06	-.03	-.02	.02
(3) Ambiguous-Precise	.91	-.00	.05	-.00	-.02
(4) General-Clear-Cut	.87	.06	.03	-.03	.01
(5) This health message about alcohol contained specific recommendations regarding the appropriate amount of alcohol to drink.	.76	-.15	-.10	.16	.04
(6) Not Sensational-Sensational	.04	-.10	.85	-.01	-.12
(7) Not Vivid-Vivid	.06	-.05	.87	-.07	-.05
(8) Not Graphic-Graphic	-.14	.05	.68	.10	.05
(9) Pleasant-Gruesome	-.07	.04	.56	.19	.00
(10) Dull-Colorful	-.03	.05	.79	-.11	.01
(11) Weak-Strong	.10	.02	.64	-.03	.23
(12) In the message you just read, picturing the consequences associated with drinking too much alcohol was…	.02	-.01	.02	-.02	.93
(13) In the message you just read, imagining the consequences associated with drinking too much alcohol was…	-.03	-.01	.03	.05	.88

Table 2.1 (continued)

Factor Analysis of Alcohol Print Message

Item	Factor				
	I	II	III	IV	V
(14) This message made me feel like I have no choice in determining how much alcohol I drink.	.06	.01	-.02	.92	.05
(15) This message made me feel like I have no control in determining how much alcohol I drink.	.01	.04	-.03	.90	.01
(16) This message made me feel like I do not have the freedom to choose how much alcohol I drink.	-.01	.09	.04	.84	.03
(17) This message tried to make my decision for me.	.05	.83	-.01	.11	.00
(18) This message tried to manipulate me.	-.02	.85	.03	.02	-.08
(19) This message tried to pressure me.	-.01	1.0	-.06	-.13	.08
(20) This message threatened my freedom to choose.	-.01	.57	.09	.29	-.08
(21) This message contained opinionated language.	-.02	.80	-.03	-.05	.02
Percent of Variance Explained	33.70	20.60	13.94	5.78	5.08

*Loadings above .60 are underlined to aid interpretation.

Table 2.2

Correlation Matrix of 5 Factors for Alcohol Message

	I	II	III	IV	VI
I					
II	.08				
III	.34**	.28**			
IV	.20**	.65**	.29**		
V	.24**	.05	.54**	.02	

Note. *p<.05; **p<.01. Factor I = Explicit Language; Factor II = Threat-to-Choice Language - Message; Factor III = Vivid Language; Factor IV = Threat-to-Choice Language - Personal; and Factor V = Imagined Consequences.

Table 2.3

Factor Analysis of Exercise Print Message

Item	Factor			
	I	II	III	IV
(1) Nonspecific-Specific	-.01	.95	.02	-.01
(2) Vague-Exact	.02	.95	-.02	-.03
(3) Ambiguous-Precise	-.01	.97	.05	-.01
(4) General-Clear-Cut	.03	.88	.06	-.06
(5) This health message about exercise contained specific recommendations regarding the appropriate amount of exercise.	-.02	.77	-.12	.12
(6) Not Sensational-Sensational	.65	.07	-.07	.08
(7) Not Vivid-Vivid	.86	.01	.03	-.05
(8) Not Graphic-Graphic	.82	-.05	.01	.00
(9) Pleasant-Gruesome	.80	.04	.03	-.07
(10) Dull-Colorful	.88	-.07	-.09	.09
(11) Weak-Strong	.86	.01	.01	-.01
(12) In the message you just read, picturing the consequences associated with not exercising was…	.82	.06	.00	-.03
(13) In the message you just read, imagining the consequences associated with not exercising was…	.80	.04	.03	-.07
(14) This message made me feel like I have no choice in determining how much exercise I do.	.01	.04	.06	.84

Table 2.3 (continued)

Factor Analysis of Exercise Print Message

Item	Factor			
	I	II	III	IV
(15) This message made me feel like I have no control in determining how much exercise I do.	-.00	.00	-.04	.96
(16) This message made me feel like I do not have the freedom to choose how much exercise I do.	.02	-.03	.14	.82
(17) This message tried to make my decision for me.	-.00	.05	.83	.10
(18) This message tried to manipulate me.	-.02	-.08	.89	-.05
(19) This message tried to pressure me.	.01	.01	.96	-.12
(20) This message threatened my freedom to choose.	-.04	.02	.63	.25
(21) This message contained opinionated language.	.05	-.00	.75	.01
Percent of Variance Explained	33.91	21.27	16.43	5.79

*Loadings above .60 are underlined to aid interpretation.

Table 2.4

Correlation Matrix of 4 Factors for Exercise Message

	I	II	III	IV
I				
II	.27**			
III	.26**	.03		
IV	.17**	.14**	.60**	

Note. *p<.05; **p<.01. Factor I = Vivid Language; Factor II = Explicit Language; Factor III = Threat-to-Choice Language - Message; Factor IV = Threat-to-Choice Language - Personal.

Table 2.5

Factor Analysis of Sunscreen Print Message

Item	Factor			
	I	II	III	IV
(1) Nonspecific-Specific	-.03	.97	.04	.02
(2) Vague-Exact	-.02	.97	.01	.01
(3) Ambiguous-Precise	.00	.95	-.03	.05
(4) General-Clear-Cut	.00	.95	-.01	-.02
(5) This health message about sunscreen contained specific recommendations regarding the appropriate amount of sunscreen to wear.	.02	.77	-.02	-.04
(6) Not Sensational-Sensational	.78	.00	-.04	.05
(7) Not Vivid-Vivid	.93	.05	-.04	-.04
(8) Not Graphic-Graphic	.88	-.09	.00	.01
(9) Pleasant-Gruesome	.64	-.11	-.03	.07
(10) Dull-Colorful	.84	.03	.10	-.11
(11) Weak-Strong	.87	.08	.09	-.04
(12) In the message you just read, picturing the consequences associated with not using sunscreen was…	.81	-.00	-.10	.12
(13) In the message you just read, imagining the consequences associated with not using sunscreen was…	.81	-.00	-.10	.12

Table 2.5 (continued)

Factor Analysis of Sunscreen Print Message

Item	Factor			
	I	II	III	IV
(14) This message made me feel like I have no choice in determining how much sunscreen I wear.	.04	-.01	.08	.82
(15) This message made me feel like I have no control in determining how much sunscreen I wear.	-.03	.01	-.02	.99
(16) This message made me feel like I do not have the freedom to choose how much sunscreen I wear.	.01	.02	.02	.91
(17) This message tried to make my decision for me.	-.07	.04	.83	.11
(18) This message tried to manipulate me.	-.03	-.02	.93	-.08
(19) This message tried to pressure me.	.04	-.05	.94	-.06
(20) This message threatened my freedom to choose.	.04	-.05	.50	.38
(21) This message contained opinionated language.	.01	.05	.71	-.01
Percent of Variance Explained	36.31	20.07	17.10	5.88

*Loadings above .60 are underlined to aid interpretation.

Table 2.6

Correlation Matrix of 4 Factors for Sunscreen Message

	I	II	III	IV
I				
II	.25**			
III	.30**	.04		
IV	.25**	.20**	.60**	

Note. *p<.05; **p<.01. Factor I = Vivid Language; Factor II = Explicit Language; Factor III = Threat-to-Choice Language - Message; Factor IV = Threat-to-Choice Language - Personal.

Table 2.7

Factor Analysis of RRS (Exercise Print Message)

Item	Factor		
	I	II	III
(1) DRB Motivated-Unmotivated	.03	-.05	.95
(2) DRB Determined-Not Determined	.05	.07	.79
(3) DRB Encouraged-Not Encouraged	-.01	-.03	.92
(4) DRB Inspired-Not Inspired	-.05	.12	.84
(5) IR Motivated-Unmotivated	.04	.87	.04
(6) IR Determined-Not Determined	-.03	.87	.01
(7) IR Encouraged-Not Encouraged	.01	.91	.01
(8) IR Inspired-Not Inspired	-.02	.92	.00
(9) DRU Motivated-Unmotivated	.90	.02	.04
(10) DRU Determined-Not Determined	.95	-.01	-.00
(11) DRU Encouraged-Not Encouraged	.95	-.01	-.02
(12) DRU Inspired-Not Inspired	.93	.01	-.01
Percent of Variance Explained	52.50	21.53	8.80

*Loadings above .60 are underlined to aid interpretation.

Table 2.8

Factor Analysis of RRS (Sunscreen Print Message)

Item	Factor		
	I	II	III
(1) DRB Motivated-Unmotivated	.00	-.05	.95
(2) DRB Determined-Not Determined	-.07	.07	.85
(3) DRB Encouraged-Not Encouraged	.07	-.04	.85
(4) DRB Inspired-Not Inspired	-.00	.08	.85
(5) IR Motivated-Unmotivated	.02	.91	.01
(6) IR Determined-Not Determined	-.06	.93	-.02
(7) IR Encouraged-Not Encouraged	.04	.88	.04
(8) IR Inspired-Not Inspired	.02	.94	.01
(9) DRU Motivated-Unmotivated	.89	-.02	.05
(10) DRU Determined-Not Determined	.96	.02	-.01
(11) DRU Encouraged-Not Encouraged	.97	-.01	-.01
(12) DRU Inspired-Not Inspired	.97	.00	-.03
Percent of Variance Explained	44.50	28.41	11.45

*Loadings above .60 are underlined to aid interpretation.

Table 3.1

Factor Loadings for Indicator Variables in Full Processing Models

Latent Factor and Items	Exercise Measurement Model Loading	Sunscreen Measurement Model Loading
Threat-to-Choice		
Choice	.88	.80
Control	.93	.96
Freedom	.93	.87
Vividness		
Sensational	.71	.71
Vivid	.98	.98
Graphic	.82	.89
Explicitness		
Specific	.92	.95
Exact	.96	.98
Precise	.95	.97
Clear cut	.92	.95
Reactance		
Unfavorable Cognitions	.59	.50
Anger	.91	.91

Table 3.2

Means, Standard Deviations, and Correlations among Variables in Exercise Model (*N* = 541)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.82	1.0													
(3)	.82	.86	1.0												
(4)	.18	.14	.15	1.0											
(5)	.23	.18	.20	.70	1.0										
(6)	.26	.22	.24	.58	.81	1.0									
(7)	.15	.11	.09	.25	.22	.14	1.0								
(8)	.13	.09	.07	.28	.20	.13	.89	1.0							
(9)	.12	.08	.08	.26	.23	.16	.88	.92	1.0						
(10)	.14	.12	.11	.28	.23	.16	.84	.88	.88	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.2 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.31	.27	.29	-.08	.02	.05	-.07	-.08	-.08	-.08	1.0				
(12)	.45	.46	.48	.04	.15	.19	.01	-.04	-.04	-.01	.53	1.0			
(13)	.19	.24	.26	-.10	-.07	.00	-.11	-.11	-.12	-.15	.35	.40	1.0		
(14)	.12	.16	.16	-.02	-.05	.01	.02	.00	-.01	-.04	.08	.16	.41	1.0	
(15)	.07	.10	.10	-.09	-.07	-.01	-.10	-.08	-.09	-.14	.21	.28	.64	.26	1.0
M	2.97	2.58	2.65	4.05	4.41	3.96	4.60	4.26	4.37	4.24	-.01	-.01	2.76	1.98	3.09
SD	1.84	1.67	1.75	1.73	1.89	1.88	2.09	1.99	1.94	2.07	1.00	.99	1.44	1.12	1.31

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.3

Means, Standard Deviations, and Correlations among Variables in Sunscreen Model (*N* = 535)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.77	1.0													
(3)	.69	.84	1.0												
(4)	.19	.13	.12	1.0											
(5)	.19	.12	.11	.70	1.0										
(6)	.22	.14	.16	.62	.88	1.0									
(7)	.13	.09	.10	.10	.13	.11	1.0								
(8)	.14	.10	.10	.12	.14	.11	.94	1.0							
(9)	.15	.11	.10	.12	.14	.10	.92	.95	1.0						
(10)	.14	.10	.11	.14	.14	.11	.91	.92	.94	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.3 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.10	.08	.06	-.08	-.05	.01	-.03	-.01	-.01	-.05	1.0				
(12)	.30	.29	.34	.01	-.01	.07	-.03	.01	-.00	-.03	.46	1.0			
(13)	.07	.07	.10	-.17	-.15	-.13	.01	.05	.02	.03	.26	.33	1.0		
(14)	.05	.04	.01	-.15	-.13	-.09	-.01	.01	-.00	-.00	.06	.15	.25	1.0	
(15)	.03	-.04	.01	-.03	.01	.05	-.01	.01	.01	.01	.12	.13	.52	.10	1.0
M	2.78	2.45	2.35	4.15	4.55	4.34	4.34	4.19	4.22	4.25	.00	.01	3.58	2.02	3.95
SD	1.74	1.56	1.63	1.69	1.89	1.98	2.37	2.27	2.21	2.29	1.0	1.0	1.46	1.13	1.37

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.4

	1	2	3	4	5	6	7	8
Exercise	$.40_{a}$ (.91)	$.50_{ab}$ (.95)	$.23_{a}$ (.89)	$.17_{ac}$ (.90)	$-.41_{d}$ (.64)	$-.40_{d}$ (.66)	$-.29_{d}$ (.71)	$-.22_{d}$ (.73)
Sunscreen	$.54_{a}$ (.77)	$.52_{a}$ (.87)	$.17_{b}$ (.89)	$.06_{b}$ (.78)	$-.29_{c}$ (.73)	$-.35_{c}$ (.80)	$-.19_{c}$ (.72)	$-.41_{c}$ (.65)

Note. 1 = high threat-to-choice, explicit, and vivid language; 2 = high threat-to-choice, implicit, and vivid language; 3 = high threat-to-choice, explicit, and non-vivid language; 4 = high threat-to-choice, implicit, and non-vivid language; 5 = low threat-to-choice, implicit, and non-vivid language; 6 = low threat-to-choice, explicit, and non-vivid language; 7 = low threat-to-choice, implicit, and vivid language; 8 = low threat-to-choice, explicit, and vivid language. Means with the same letters in the subscript are not significantly different at $p < .05$.

Table 3.5

Factor Loadings for Indicator Variables for High (HII) and Low Issue Involvement (LII) in Exercise Model

Latent Factor and Items	HII Measurement Model Loading	LII Measurement Model Loading
Threat-to-Choice		
Choice	.84	.94
Control	.94	.91
Freedom	.93	.94
Vividness		
Sensational	.74	.68
Vivid	.96	.85
Graphic	.91	.86
Explicitness		
Specific	.92	.92
Exact	.94	.97
Precise	.96	.94
Clear cut	.91	.93
Reactance		
Unfavorable Cognitions	.59	.61
Anger	.91	.91

Table 3.6

Means, Standard Deviations, and Correlations among Variables in Low Issue Involvement Exercise Model (*N* = 252)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.85	1.0													
(3)	.88	.85	1.0												
(4)	.17	.16	.16	1.0											
(5)	.19	.14	.20	.67	1.0										
(6)	.19	.14	.19	.52	.80	1.0									
(7)	.17	.14	.18	.27	.30	.17	1.0								
(8)	.17	.15	.17	.34	.27	.18	.90	1.0							
(9)	.14	.12	.16	.32	.31	.22	.86	.91	1.0						
(10)	.18	.15	.20	.31	.29	.19	.84	.90	.89	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.6 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.25	.19	.24	-.10	-.03	-.02	-.06	-.08	-.09	-.06	1.0				
(12)	.42	.41	.44	.00	.11	.11	.04	-.02	-.02	.00	.55	1.0			
(13)	.13	.16	.15	-.10	.13	-.06	-.17	-.19	-.21	-.23	.44	.41	1.0		
(14)	.18	.20	.17	-.04	.01	.08	.01	-.02	-.05	-.03	.13	.27	.43	1.0	
(15)	.07	.07	.09	-.10	-.11	.02	-.12	-.11	-.13	-.12	.30	.24	.60	.34	1.0
M	3.02	2.75	2.81	4.04	4.35	3.88	4.60	4.27	4.41	4.31	.06	.07	3.21	2.25	3.37
SD	1.79	1.67	1.72	1.77	1.83	1.82	2.08	1.99	1.97	2.08	1.0	1.0	1.41	1.16	1.22

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.7

Means, Standard Deviations, and Correlations among Variables in High Issue Involvement Exercise Model (*N* = 291)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.79	1.0													
(3)	.78	.88	1.0												
(4)	.19	.12	.12	1.0											
(5)	.25	.21	.20	.71	1.0										
(6)	.32	.29	.29	.61	.81	1.0									
(7)	.12	.08	.02	.23	.14	.11	1.0								
(8)	.07	.03	-.02	.23	.14	.11	.86	1.0							
(9)	.09	.05	.01	.22	.16	.13	.88	.90	1.0						
(10)	.09	.07	.02	.24	.18	.13	.84	.85	.88	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.7 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.37	.30	.32	-.05	.05	.11	-.09	-.10	-.12	-.11	1.0				
(12)	.49	.47	.49	.07	.19	.25	-.03	-.08	-.09	-.07	.54	1.0			
(13)	.27	.27	.32	-.10	.00	.07	-.09	-.07	-.09	-.12	.29	.40	1.0		
(14)	.07	.10	.12	.00	-.09	-.02	.04	.03	.01	-.05	.04	.06	.31	1.0	
(15)	.05	.07	.06	-.06	-.00	-.01	-.10	-.03	-.08	-.15	.10	.26	.60	.14	1.0
M	2.91	2.41	2.47	4.04	4.46	4.01	4.60	4.23	4.31	4.19	-.06	-.08	2.37	1.76	2.87
SD	1.90	1.68	1.75	1.71	1.94	1.94	2.14	2.02	1.97	2.07	1.01	.98	1.37	1.06	1.37

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.8

Factor Loadings for Indicator Variables for High (HII) and Low Issue Involvement (LII) in Sunscreen Model

Latent Factor and Items	HII Measurement Model Loading	LII Measurement Model Loading
Threat-to-Choice		
Choice	.82	.80
Control	.95	.98
Freedom	.89	.86
Vividness		
Sensational	.72	.69
Vivid	1.0	.95
Graphic	.87	.88
Explicitness		
Specific	.95	.96
Exact	.97	.98
Precise	.97	.96
Clear cut	.95	.94
Reactance		
Unfavorable Cognitions	.49	.51
Anger	.91	.91

Table 3.9

Means, Standard Deviations, and Correlations among Variables in Low Issue Involvement Sunscreen Model (N = 261*)*

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.79	1.0													
(3)	.68	.84	1.0												
(4)	.18	.12	.12	1.0											
(5)	.21	.10	.08	.66	1.0										
(6)	.19	.09	.10	.60	.84	1.0									
(7)	.11	.04	.02	.14	.14	.16	1.0								
(8)	.12	.05	.03	.14	.14	.15	.95	1.0							
(9)	.13	.07	.05	.15	.15	.15	.92	.95	1.0						
(10)	.12	.06	.06	.14	.14	.14	.91	.92	.93	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.9 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.06	.03	.03	-.10	-.05	.01	-.05	-.02	-.00	-.06	1.0				
(12)	.26	.23	.27	-.04	-.05	-.00	-.06	-.02	-.03	-.05	.47	1.0			
(13)	.02	.06	.02	-.17	-.15	-.15	-.01	.02	.02	.02	.17	.28	1.0		
(14)	.02	-.00	-.07	-.23	-.16	-.12	-.09	-.06	-.09	-.05	.04	.14	.16	1.0	
(15)	-.02	-.08	-.08	-.00	.04	.07	-.04	.02	.03	.02	.12	.16	.55	.07	1.0
M	2.77	2.50	2.47	4.0	4.44	4.22	4.36	4.23	4.25	4.36	.05	.10	4.22	2.18	4.22
SD	1.77	1.63	1.76	1.66	1.90	1.94	2.38	2.30	2.21	2.30	.97	1.02	1.36	1.24	1.32

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.10

Means, Standard Deviations, and Correlations among Variables in High Issue Involvement Sunscreen Model (N = 283)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	1.0														
(2)	.78	1.0													
(3)	.72	.84	1.0												
(4)	.17	.11	.09	1.0											
(5)	.18	.16	.15	.72	1.0										
(6)	.23	.18	.20	.62	.87	1.0									
(7)	.16	.15	.18	.07	.11	.09	1.0								
(8)	.17	.15	.18	.11	.13	.09	.93	1.0							
(9)	.17	.15	.16	.10	.13	.08	.91	.95	1.0						
(10)	.18	.14	.18	.14	.14	.10	.90	.91	.93	1.0					

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

Table 3.10 (continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(11)	.15	.12	.07	-.03	-.03	.05	-.02	-.01	-.03	-.07	1.0				
(12)	.36	.36	.39	.05	.04	.13	.02	.04	.02	-.02	.44	1.0			
(13)	.11	.04	.13	-.12	-.13	-.08	.02	.05	.03	.04	.33	.32	1.0		
(14)	.16	.17	.19	-.08	-.08	-.03	.03	.05	.03	.04	.06	.15	.21	1.0	
(15)	.07	-.03	.06	-.02	.02	.10	.02	-.01	-.01	.01	.08	.05	.44	.06	1.0
M	2.82	2.45	2.28	4.27	4.65	4.44	4.29	4.13	4.18	4.13	-.05	-.09	2.98	1.93	3.63
SD	1.75	1.55	1.55	1.73	1.90	2.02	2.36	2.24	2.22	2.30	1.03	.98	1.30	1.18	1.46

Note. 1 = No Choice, 2 = No Control, 3 = No Freedom, 4 = Sensational, 5 = Vivid, 6 = Graphic, 7 = Specific, 8 = Exact, 9 = Precise, 10 = Clear-Cut, 11 = Unfavorable Cognitions, 12 = Anger, 13 = Boomerang, 14 = Related Boomerang, 15 = Vicarious Boomerang.

VITA

Brian Lee Quick was born on June 22, 1977 in South Bend, Indiana and is an American citizen. He graduated from Brandywine High School in Niles, Michigan in 1995. He earned his Bachelor of Science degree in Mass Communication from the College of the Ozarks in 1999. From there, he enrolled at Southwest Missouri State University where he earned his Master of Arts degree in May of 2001. Following graduation, he began work on his Ph.D. at the University of Missouri. After a year at the University of Missouri, he transferred to Texas A&M University to complete his doctoral degree. He was awarded the Doctor of Philosophy degree from Texas A&M University in August of 2005. His research and teaching interests include health campaigns, persuasion theory, message processing, statistical analysis, research design, and scale development. He published some of his research within *Communication Teacher*, *Health Communication*, *Journal of Health Communication*, *and Journal of Safety Research*. Brian can be reached at Ohio University, School of Communication Studies, Lasher Hall, Athens, OH 45701.